PMBeICOL PEmails

From: Spink, Thomas E [tespink@tva.gov]
Sent: Friday, July 25, 2008 1:19 PM
To: Joseph Sebrosky
Cc: Sterdis, Andrea Lynn
Subject: Courtesy email copy of TVA's Response to Items Identified in NRC Hydrology Related Site Visit Trip Report
Attachments: BLN Response to NRC Trip Report for signature 20080723.pdf

Joe:

Please let me introduce myself. I am Tom Spink and I am a new Licensing Project Manager working for Andrea Sterdis at TVA. I will be sharing responsibilities for RAI responses with Phil Ray. My contact information is LP-5A, 1101 Market Street, Chattanooga 37402. My telephone number is 423-751-7062 and this email provides my email address.

I have enclosed a pdf copy of our response to Items Identified in NRC Hydrology Related Site Visit Trip Report with this email as a courtesy. As always, the official submittal has been submitted to the Document Control Desk via paper copy using Federal Express services. The paper copy should have arrived on July 24, 2008.

If you have any questions, please do not hesitate to call me.

Thanks,

Thomas E. Spink
Licensing Project Manager
Nuclear Generation Development
1101 Market Street, LP 5A
Chattanooga, TN 37402
423-751-7062 Fax: (423)-751-6509

Hearing Identifier: Bellefonte_COL_Public_EX
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Sent Date: 7/25/2008 1:18:42 PM
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From: Spink, Thomas E

Created By: tespink@tva.gov

Recipients:
"Sterdis, Andrea Lynn" <alsterdis@tva.gov>
Tracking Status: None
"Joseph Sebrosky" <Joseph.Sebrosky@nrc.gov>
Tracking Status: None

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Options
Priority: Standard
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Tennessee Valley Authority, 1101 Market Street, LP 5A, Chattanooga, Tennessee 37402-2801

July 23, 2008

10 CFR 52.79

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

In the Matter of)
Tennessee Valley Authority)

Docket No. 52-014 and 52-015

BELLEFONTE COMBINED LICENSE APPLICATION – ITEMS IDENTIFIED IN NRC HYDROLOGY RELATED SITE VISIT TRIP REPORT

Reference: Memorandum from Joseph Sebrosky (NRC) to Stephanie Coffin (NRC), Trip Report – May 13-16, 2008, Hydrology-Related Site Visit in Support of the Bellefonte Combined License Application, dated June 12, 2008

This letter provides information to address the four items identified in the cover memorandum of the referenced Nuclear Regulatory Commission (NRC) trip report. Each item is addressed in the enclosure.

If you should have any questions, please contact Thomas Spink at 1101 Market Street, LP5A, Chattanooga, Tennessee 37402-2801, by telephone at (423) 751-7062, or via email at tespink@tva.gov.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on this 23rd day of July, 2008.

Jack A. Bailey
Vice President, Nuclear Generation Development

Enclosure
cc: See Page 2

cc: (with Enclosure)

J. P. Berger, EDF
J M. Sebrosky, NRC/HQ
E. Cummins, Westinghouse
S. P Frantz, Morgan Lewis
M.W. Gettler, FP&L
R . Grumbir, NuStart
P. S. Hastings, NuStart
P Hinnenkamp, Entergy
M.C. Kray, NuStart
D. Lindgren, Westinghouse
G. D. Miller, PG&N
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N. T. Simms, Duke Energy
G. A. Zinke, NuStart

cc: (w/o Enclosure)

B. C. Anderson, NRC/HQ
M.M. Comar, NRC/HQ
B. Hughes/NRC/HQ
R. G. Joshi, NRC/HQ
R. H. Kitchen, PGN
M.C. Kray, NuStart
A. M. Monroe, SCE&G
C. R. Pierce, SNC
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L. Reyes, NRC/RII
T. Simms, NRC/HQ

Enclosure
TVA letter dated July 23, 2008
Trip Report Actions

Actions Identified by NRC Trip Report Related to May 13-16, 2008, Hydrology-Related Site Visit.
(8 pages, including this list)

Item 1 indicates that the NRC Staff requested the Tennessee Valley Authority (TVA) to document in a letter that it was revising its schedule for a planned revision to the April 17, 2008, white paper regarding the hydrology analysis description and to provide a justification for why the delay should not impact the overall schedule. This information was provided to NRC in a letter from TVA dated June 30, 2008.

Item 2 indicates that the NRC Staff requested the TVA to identify the schedule for completion of various items related to 1) the confirmation of the input data packages for the SOCH model, 2) the availability of the SOCH model simulations, and 3) completion of the verification and validation of the SOCH computer code. This information was provided to NRC in a second letter from TVA dated June 30, 2008.

Item 3 indicates that the TVA would provide a revised porosity analysis. This information is provided on the remaining pages of this enclosure.

Item 4 indicates that the NRC Staff would be requesting additional information. TVA will respond to the requests for additional information (RAI) following receipt of each formal request.

NRC Hydrology Site Visit Trip Report Action 3
Related to Discussion Items 12 and 25

This information addresses item 3 identified in the NRC hydrology site visit trip report. During the site visit, TVA had indicated that the porosity value used for determining the groundwater velocity at the BLN site had been determined to be incorrect and that the evaluation and FSAR description would be revised. Related items are identified in the trip report as discussion items numbered 12 and 25.

The identified actions to revise the evaluation are:

1. Determine correct porosity value to be used in calculations.
2. Determine the proper value of hydraulic conductivity to be used in calculations.
3. Tie porosity information from Section 2.5 to Section 2.4.
4. Determine proper groundwater velocity.
5. Identify necessary FSAR updates associated with above items.
6. Provide pump test report data to the NRC.

These required actions are addressed in the following BLN RESPONSE as follows:

1. The revised porosity value is determined and the value and supporting information are contained in Section 2.0 and Attachment A.
2. The revised hydraulic conductivity value is determined and is contained in Section 1.0, second paragraph, Subsection 3.1.
3. With the FSAR corrections associated with actions 1 and 2 above, the porosity values used in Section 2.4 are changed to specific values for the depths of interest for the groundwater velocity calculations. Section 2.5 was investigated and determined to discuss total boring program void ratios encountered; these Section 2.5 void ratios described are not used in Section 2.4.
4. Groundwater velocity calculations are revised with the process, assumptions, and supporting documentation described in Sections 1.0 through 4.0.
5. FSAR changes related to the revised porosity value are addressed in "ASSOCIATED BLN COL APPLICATION REVISIONS", items #1 and #4.
   FSAR changes related to the revised hydraulic conductivity value are addressed in "ASSOCIATED BLN COL APPLICATION REVISIONS", item #4.
   FSAR changes related to the revised groundwater velocity calculations are addressed in "ASSOCIATED BLN COL APPLICATION REVISIONS", items #2 through #5.
6. Pump test report data is provided in Attachment B.

BLN RESPONSE:

1.0 Introduction

On May 13, 2008, it was determined that the porosity value identified in Subsection 2.4.12.2.4.2 of the BLN FSAR required revision. The FSAR states that the porosity of the upper 20 feet of the Stones River Group limestone was historically reported as 0.04 and the porosity determined during the 2006 pre-COL application investigation was 0.05.

Additionally, Subsection 2.4.12.3 stated that, for conservatism, the highest hydraulic conductivity measured on-site to-date was used in the calculations. The hydraulic conductivity from the September, 2006 aquifer pump testing (observation well OW-12 value) was used (3.95×10^{-3} cm/s); however, it has been determined that the packer test from boring B-1046 reported a hydraulic conductivity of 4.2×10^{-3} cm/s. Therefore, this value is also being revised.

The groundwater velocities for the BLN site have been recalculated using a formation porosity of 0.018 and the B-1046 packer test hydraulic conductivity of 4.2×10^{-3} cm/s with the calculated monthly groundwater velocities (in ft/day) from Unit #3 towards Town Creek (Figure 1a) as follows:

7/11/06	8/31/06	9/21/06	10/26/06	11/13/06	12/11/06	1/4/07	2/1/07	3/5/07	4/17/07	5/8/07
1.20	2.24	2.49	2.84	2.90	2.17	3.05	3.32	3.32	3.05	2.49

Although the conservative groundwater pathway was assessed from Unit #4 to the Intake Channel (see Figure 1b), this pathway is considered unlikely due to the flow dynamics near the southeast edge of the Unit #4 construction zone and monthly variations in observed groundwater flow gradient direction.

2.0 Porosity Evaluation

The ratio of voids encountered to the length of the core borings (void ratio), roughly equivalent to the formation, or "karst," porosity, was 0.005 for the core borings performed during the 2006 geotechnical investigation (see Attachment A). As the majority of groundwater is considered to move in the upper 20 feet of rock (i.e., the epikarst) the void ratios were determined for the intervals 5 ft, 10 ft, 20 ft, and 30 ft below the top of rock. These ratios are presented as follows:

Top 5 feet of rock	0.014
Top 10 feet of rock	0.021
Top 20 feet of rock	0.018
Top 30 feet of rock	0.013

As predicted, the upper 5 to 20 feet of rock has the highest porosity and therefore, should constitute the majority of groundwater flow. Because the field boring program was only able to identify voids greater than or equal to approximately 0.1 ft thick, this void ratio would be an underestimation of the actual porosity within the formation. However, this method would not be able to determine that amount of the total void space that was isolated from, or poorly connected

to, the main groundwater hydrologic flow pathways, thus potentially causing an overestimation of the effective formation porosity.

The highest porosity value is reported in the upper 10 ft of rock (0.021), however, to allow for conservatism and account for potential unconnected and undetected void spaces, the effective porosity is estimated as the void ratio of the upper 20 ft of rock, or 0.018.

3.0 Groundwater Velocity Calculations

Based on information from present and previous field investigations, the karst system in the area of the BLN facility is poorly developed in that groundwater flow within the aquifer is dominated by poorly integrated pores, joints, and tubes, most with soil or clay fill. Karst aquifers exhibiting these types of groundwater conditions are termed "diffuse-type" karst aquifer systems. Due to the similarities of flow and response to aquifer input and drainage, movement of water through a diffuse karst aquifer is similar to conditions found within a granular (sand, silt, gravel) aquifer system. Movement of water in a granular aquifer can be characterized by use of Darcy's Law; therefore, application of Darcy's Law calculations is appropriate for a diffuse karst aquifer system as found at the BLN.

3.1 Pathway #1: Unit #3 to Town Creek

Based on the above findings, the groundwater velocities for the BLN site have been recalculated using a formation porosity of 0.018 and a hydraulic conductivity of 4.2×10^{-3} cm/s. Monthly groundwater velocities from Unit #3 towards Town Creek are presented in Table 1.

The sensitivity of the groundwater velocity calculations to potential differences in the actual formation porosity was investigated by calculating groundwater velocities for the range of reported porosities for the upper 5 ft, 10 ft, 20 ft, and 30 ft rock intervals, as discussed above. As shown in Table 2, and graphically depicted in Figure 2, groundwater velocities increase with decreasing porosity. Because groundwater flows are expected to be greatest in the regions with highest porosity, and porosities rapidly decrease below the top 20 ft of rock, the 30 ft porosity value was considered overly conservative. As the majority of water flow will be concentrated in the 5 to 20 foot rock depth region, the 20 ft porosity value was chosen as the conservative value as it produced higher groundwater flow velocities than the 10 ft porosity value and should capture the zone of greatest groundwater flow, compensating for undetected and unconnected voids.

The sensitivity of the groundwater velocity calculations to potential differences in the actual formation hydraulic conductivity was investigated by assessing groundwater velocities for a range of hydraulic conductivities, also compared to changing range of porosities. The highest hydraulic conductivity value (4.2×10^{-3} cm/s) was reported from packer testing of boring B-1046. As shown in Table 3, and graphically depicted in Figure 3, the average monthly groundwater velocities increase linearly by 0.08 ft/day for each 0.1×10^{-3} cm/s increase in hydraulic conductivity. Historic and recent maximum hydraulic conductivities at the site have all been reported in the same magnitude or lower than 4.2×10^{-3} cm/s; therefore, the packer test value reported from boring B-1046 is considered a conservative value and used in the groundwater velocity calculations.

3.2 Pathway #2: Unit #4 to the Intake Channel

Although the conservative groundwater pathway was assessed from Unit #4 to the Intake Channel (Table 4), this scenario is considered unlikely due to the flow dynamics near the southeast edge of the Unit #4 construction zone and monthly variations in observed groundwater flow gradient direction. Groundwater velocities were determined between MW-1205c and MW-1211c (Table

5) to assess the time that would be required for a release in the vicinity of BLN Unit #4 to reach the point where the potential groundwater surface would intersect the backfilled portion of the Essential Raw Cooling Water (ERCW) trench, determined to be approximately 680 feet from MW-1205c. Using the monthly groundwater elevations in MW-1205c and MW-1211c between July 11, 2006 and May 8, 2007, this assessment showed that the overall trend of groundwater movement from MW-1205c would be away from the intake structure (shown as negative distance values in Table 5) and groundwater from the area of BLN Unit #4 would not migrate towards the intake structure far enough to enter the ERCW trench. Therefore, this groundwater would not likely migrate to the Intake Channel.

4.0 Conclusions

Groundwater flow path and aquifer parameters of porosity and hydraulic conductivity are very difficult to determine within a poorly developed karstic system as is present at the BLN. To compensate for the inherent difficulties of determining aquifer characteristics within this type of groundwater system, a worst case method of postulating a single, straight line/shortest distance groundwater transport has been used to simplify the complex groundwater system and provide conservative values of groundwater flow velocity and transport times.

Based on this analysis, TVA has determined that using the calculated formation porosity of 0.018, from the void ratio of the upper 20 ft of rock, and the B-1046 packer test hydraulic conductivity of 4.2×10^{-3} cm/s, provides a conservative estimate of the worst case groundwater velocities and groundwater transport for any accidental release from the BLN.

Groundwater velocities were recalculated based on the corrected values of porosity and hydraulic conductivity previously described and are presented in the revised FSAR Table 2.4.12-206. This analysis resulted in faster groundwater travel times than was previously reported. Revisions to the BLN COL application are described below.

ASSOCIATED BLN COL APPLICATION REVISIONS:

1. COLA Part 2, FSAR, Chapter 2, Subsection 2.4.12.2.4.2, 1st paragraph, will be revised from:

   Water occurs in the Stones River Group Limestone in openings along fractures and bedding planes in bedrock (some of which are solutionally enlarged), and in pore spaces in the overburden. Porosity of the Stones River Group Formation limestone above and below a 20-ft. depth is 0.04 and 0.01, respectively. Total porosity is estimated at 0.05 based on total number of voids encountered during the 2006 pre-COL application site investigation; however, this is probably an underestimation of total porosity as many small cavities and fractures were not captured in the estimate.

   To read:

   Water occurs in the Stones River Group Limestone in openings along fractures and bedding planes in bedrock (some of which are solutionally enlarged), and in pore spaces in the overburden. Total porosity of the Stones River Group Formation limestone in the area of the BLN was determined to be approximately 0.005, based on total number of voids encountered during the 2006 pre-COL application site investigation (Subsection 2.5.4.1.3.1); however, this is probably an underestimation of total porosity as many small cavities and fractures were not captured in the estimate.

   As the majority of groundwater is considered to move in the upper 20 feet of rock (i.e., epikarst) the void ratios were determined for the intervals 5 ft, 10 ft, 20 ft, and 30 ft below the

top of rock. The upper 5 to 20 feet of rock has the highest porosity and therefore, should constitute the majority of groundwater flow. As the field boring program was only able to identify voids greater than or equal to approximately 0.1 ft thick, the void ratio identified in Section 2.5 would be an underestimation of the actual formation porosity within the formation. Further, this method would not be able to determine that amount of the total void space that was isolated from, or poorly connected to, the main groundwater hydrologic flow pathways, thus potentially causing an overestimation of the effective formation porosity.

The highest porosity value is reported in the upper 10 ft of rock (0.021), however, to allow for conservatism and account for potential unconnected and undetected void spaces, the effective porosity is estimated as the void ratio of the upper 20 ft of rock, or 0.018.

2. COLA Part 2, FSAR, Chapter 2, Subsection 2.4.12.2.4.2, 2nd to last paragraph, will be revised from:

Monthly groundwater gradients were calculated to be $1.8x10^{-3}$ - $5.0x10^{-3}$ from Unit 3 to the Town Creek embayment, and $5.0x10^{-3}$ - $6.7x10^{-3}$ between Unit 4 and the intake structure channel. Monthly groundwater flow velocities were calculated to be 0.5 – 1.4 ft/day from Unit 3 to the Town Creek embayment, and 1.4 – 1.9 ft/ day between Unit 4 and the intake structure channel. A summary of the monthly groundwater hydraulic gradients and flow velocities is presented in Table 2.4.12-206. Groundwater flow from Unit 4 towards the intake structure channel only occurs for short periods of time during wet months and normally flows towards Town Creek during the majority of the year.

To read:

Monthly groundwater gradients were calculated to be $1.8x10^{-3}$ - $5.0x10^{-3}$ from Unit 3 to the Town Creek embayment, and $5.0x10^{-3}$ - $6.7x10^{-3}$ between Unit 4 and the intake structure channel. Monthly groundwater flow velocities were calculated to be 1.20 – 3.32 ft/day from Unit 3 to the Town Creek embayment, and 3.31 – 4.44 ft/day between Unit 4 and the intake structure channel. A summary of the monthly groundwater hydraulic gradients and flow velocities is presented in Table 2.4.12-206. Groundwater flow from Unit 4 towards the intake structure channel only occurs for short periods of time during wet months and normally flows towards Town Creek during the majority of the year.

3. COLA Part 2, FSAR, Chapter 2, Subsection 2.4.12.2.4.2, last paragraph, will be revised from:

Horizontal groundwater flow velocities were determined using a conservative straight-line-flow bounding method from the groundwater well nearest the liquid radioactive waste tank in the unit closest to the discharge point using the highest measured hydraulic conductivity on-site. A straight line flow path is considered the most conservative because the actual groundwater pathways are expected to be tortuous, resulting in longer transport times, and hydraulic conductivities of the fractures/joints lower than the highest measured on-site. Because of the lower hydraulic conductivities in the soil and deeper bedrock, the majority of groundwater flow is conservatively assumed to be within the epikarst zone. Groundwater conditions are further discussed in Subsection 2.5.4.6. Groundwater characteristics associated with the karst development at the BLN is discussed in detail in Subsection 2.5.4.1.

To read:

Horizontal groundwater flow velocities were determined using a conservative straight-line-flow bounding method from the groundwater well nearest the liquid radioactive waste tank in the unit closest to the discharge point using the highest measured hydraulic conductivity on-site. A straight line flow path is considered the most conservative because the actual groundwater pathways are expected to be tortuous, resulting in longer transport times, and hydraulic

conductivities of the fractures/joints lower than the highest measured on-site. Because of the lower hydraulic conductivities in the soil and deeper bedrock, the majority of groundwater flow is conservatively assumed to be within the epikarst zone.

Based on information from present and previous field investigations, the karst system in the area of the BLN facility is poorly developed in that groundwater flow within the aquifer is dominated by poorly integrated pores, joints, and tubes, most with soil or clay fill. Karst aquifers exhibiting these types of groundwater conditions are termed "diffuse-type" karst aquifer systems. Due to the similarities of flow and response to aquifer input and drainage, movement of water through a diffuse karst aquifer is similar to conditions found within a granular (sand, silt, gravel) aquifer system. Movement of water in a granular aquifer can be characterized by use of Darcy's Law; therefore, application of Darcy's Law calculations is appropriate for a diffuse karst aquifer system as found at the BLN (Reference 249).

Groundwater conditions are further discussed in Subsection 2.5.4.6. Groundwater characteristics associated with the karst development at the BLN is discussed in detail in Subsection 2.5.4.1.

4. COLA Part 2, FSAR, Chapter 2, Table 2.4.12-206 (2 Sheets), will be replaced with the revised Table 2.4.12-206 (2 Sheets) provided in the ASSOCIATED BLN COL APPLICATION REVISIONS ATTACHMENTS (following Attachment B).

5. COLA Part 2, FSAR Chapter 2, Subsection 2.4.16, will be revised to add the following new reference:

249. U.S. Environmental Protection Agency, *Ground-Water Monitoring in Karst Terranes, Recommended Protocols & Implicit Assumptions*, EPA / 600 / x-89 / 050, March 1989.

ATTACHMENTS/ENCLOSURES:

FIGURES (7 pages including the cover sheet)

Figure 1a: Conceptual Groundwater Pathway #1

Figure 1b: Conceptual Groundwater Pathway #2

Figure 2: Change in Groundwater Velocity with Change in Porosity

Figure 3: Average Groundwater Velocity

Figure 4: Table 5 Velocity Function

Figure 5: Groundwater Distance Traveled

TABLES (6 pages including the cover sheet)

Table 1: Monthly Groundwater Gradient and Flow Velocity: BLN Unit #3 to Town Creek

Table 2: Change in Velocity due to Change in Porosity with Depth

Table 3: Average Monthly Change in Groundwater Velocity due to Change in Porosity and Hydraulic Conductivity

Table 4: Monthly Groundwater Gradient and Flow Velocity: BLN Unit #4 to Intake Channel

Table 5: Groundwater Travel Distance from MW-1205c to MW-1211c

ATTACHMENT A (3 pages including the cover sheet)

William Lettis Associates, Inc., Determination of Stones River Group Void Ratios for the BLN Site

ATTACHMENT B (38 pages including the cover sheet)

BLN Pump Test Report Data

ASSOCIATED BLN COL APPLICATION REVISIONS ATTACHMENTS (3 pages including the cover sheet)

Revised Table 2.4.12-206, 2 Sheets

FIGURES

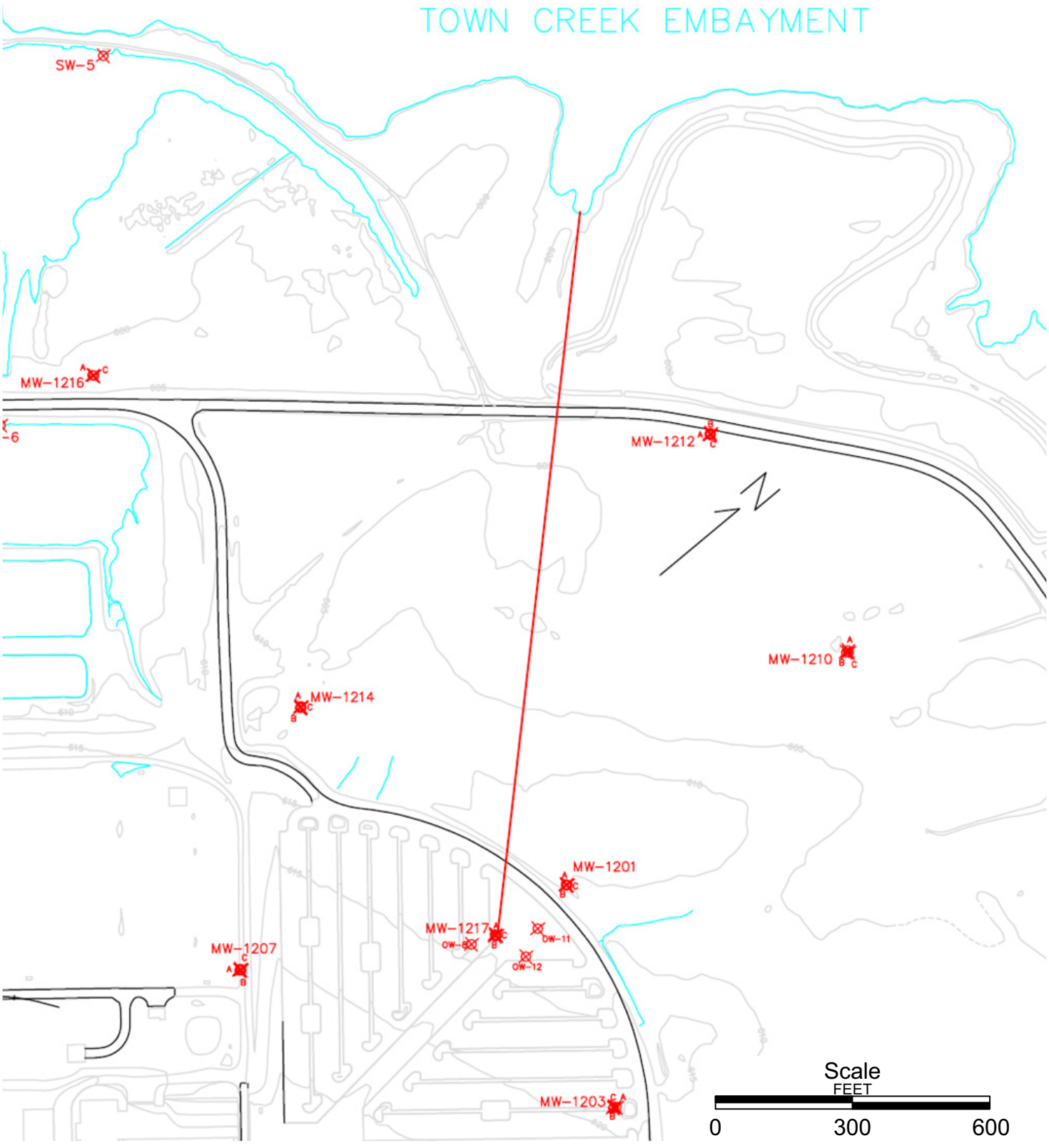


Figure 1a: Conceptual Groundwater Pathway #1

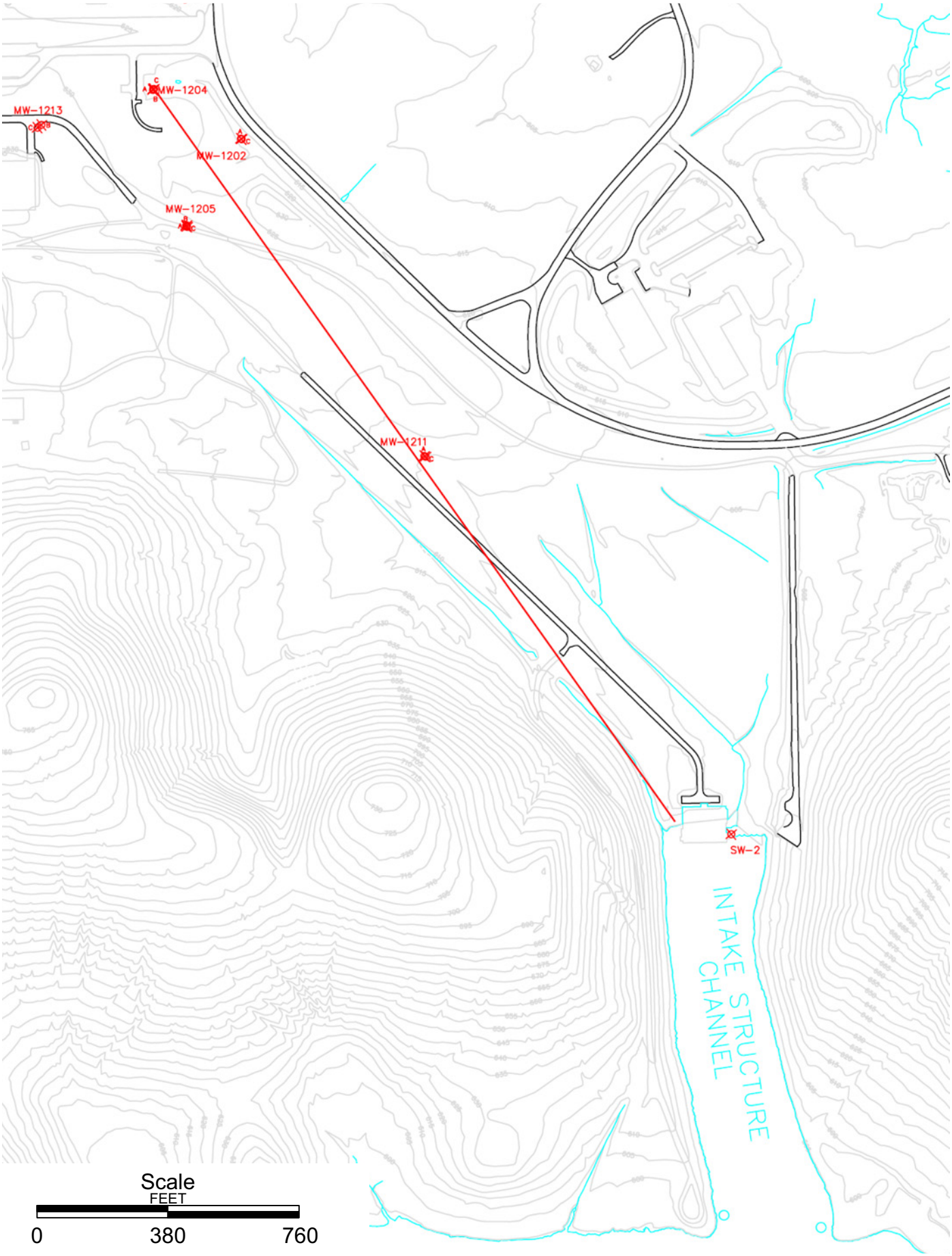


Figure 1b: Conceptual Groundwater Pathway #2

Figure 2
Change in Groundwater Velocity with Change in Porosity

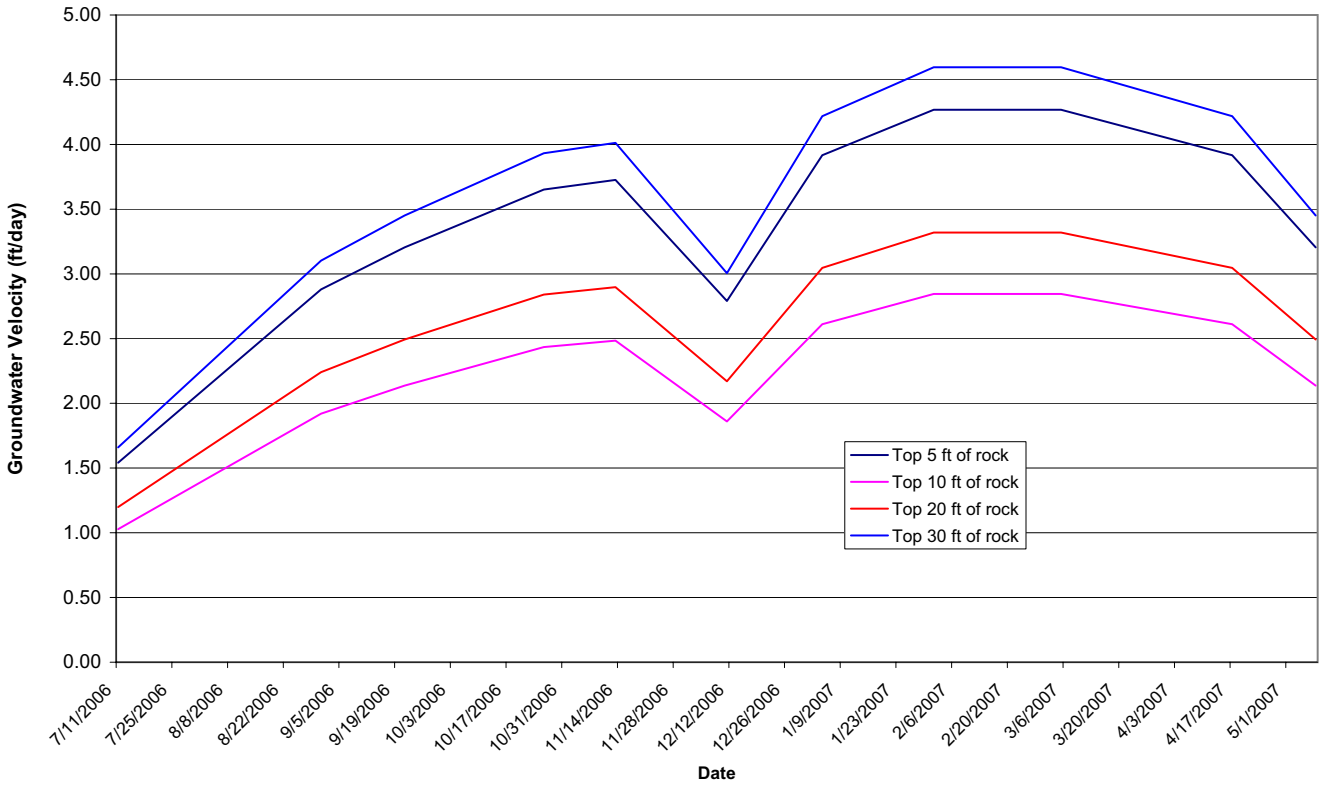


Figure 3
Average Groundwater Velocity

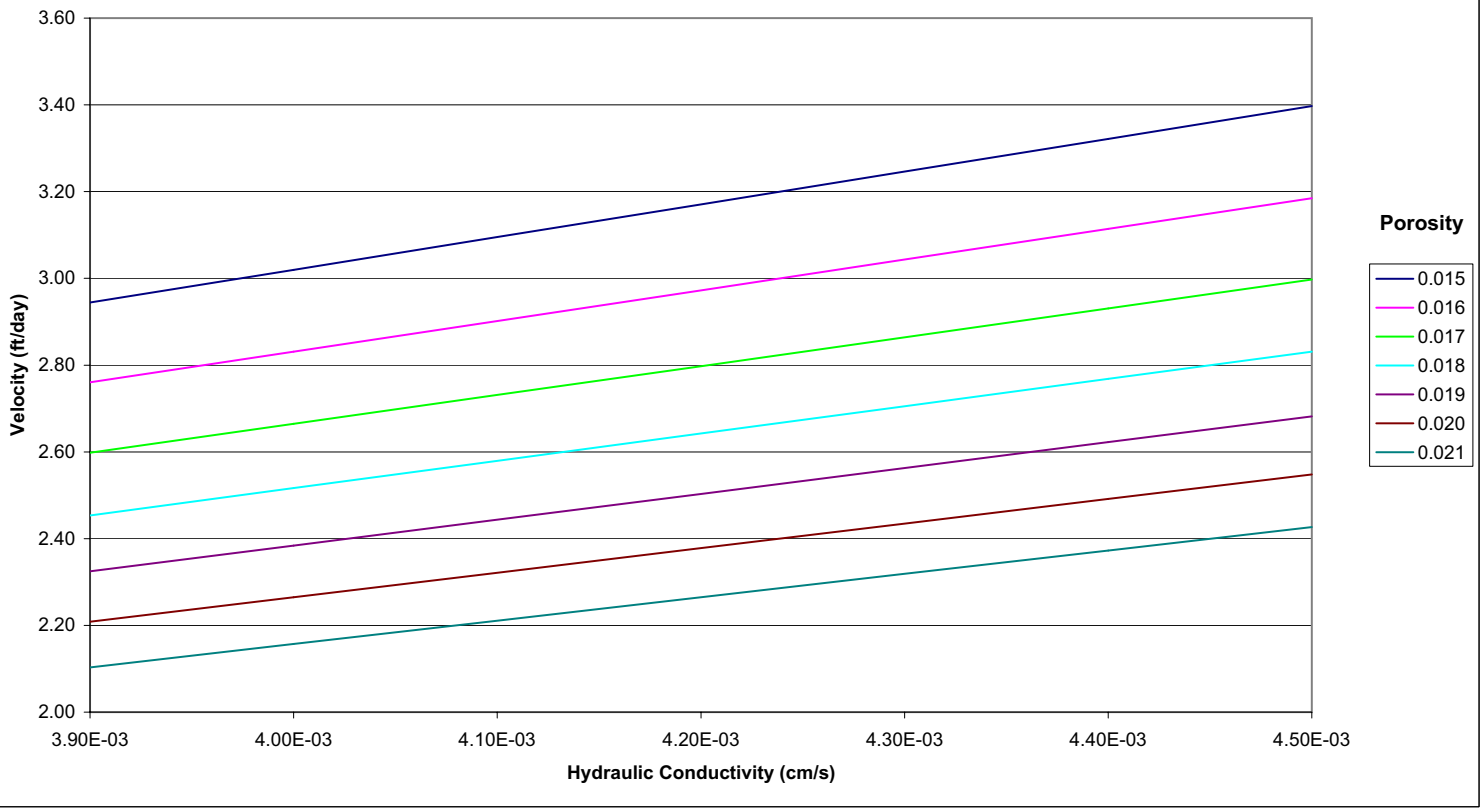


Figure 4
Table 5 Velocity Function

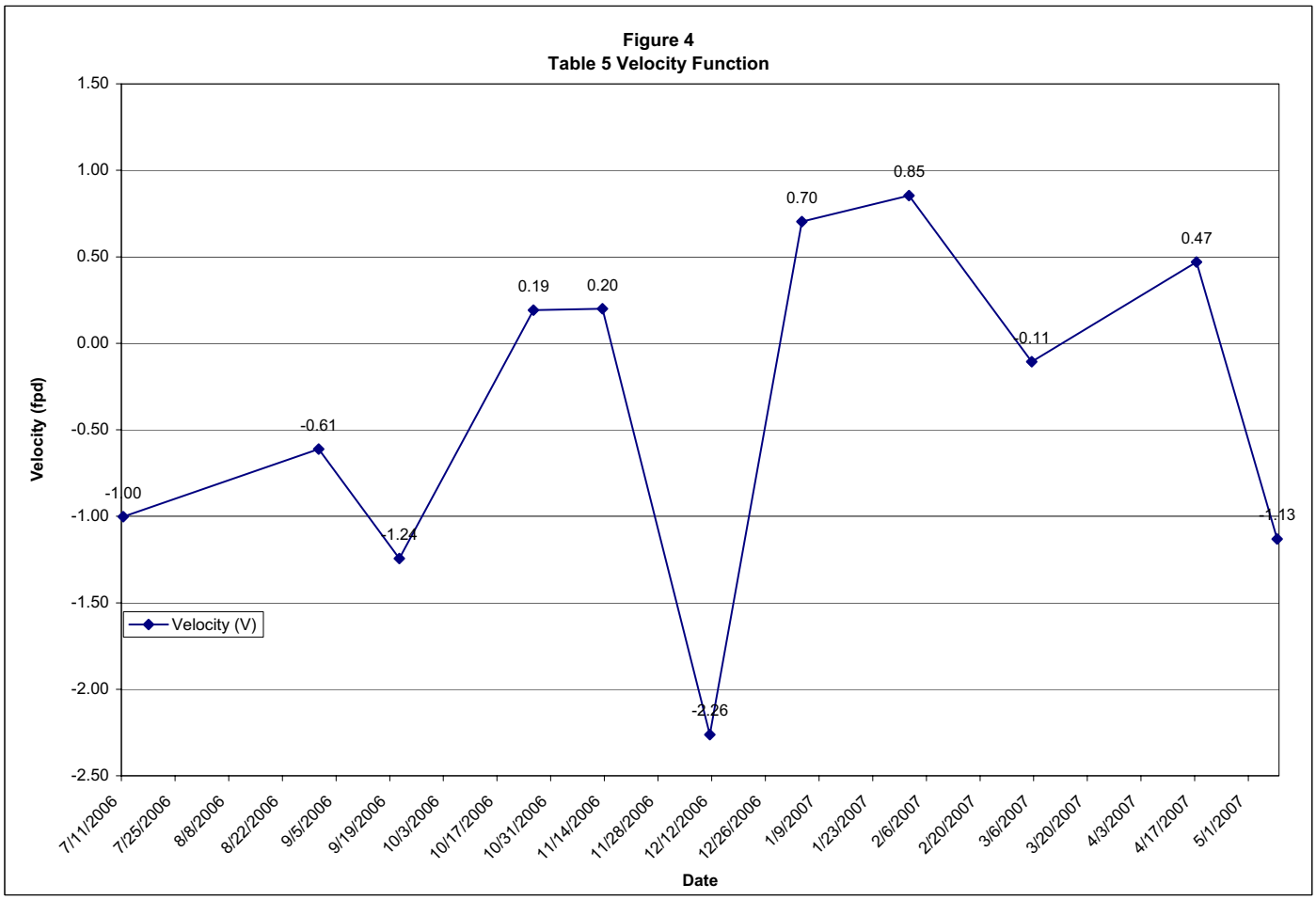
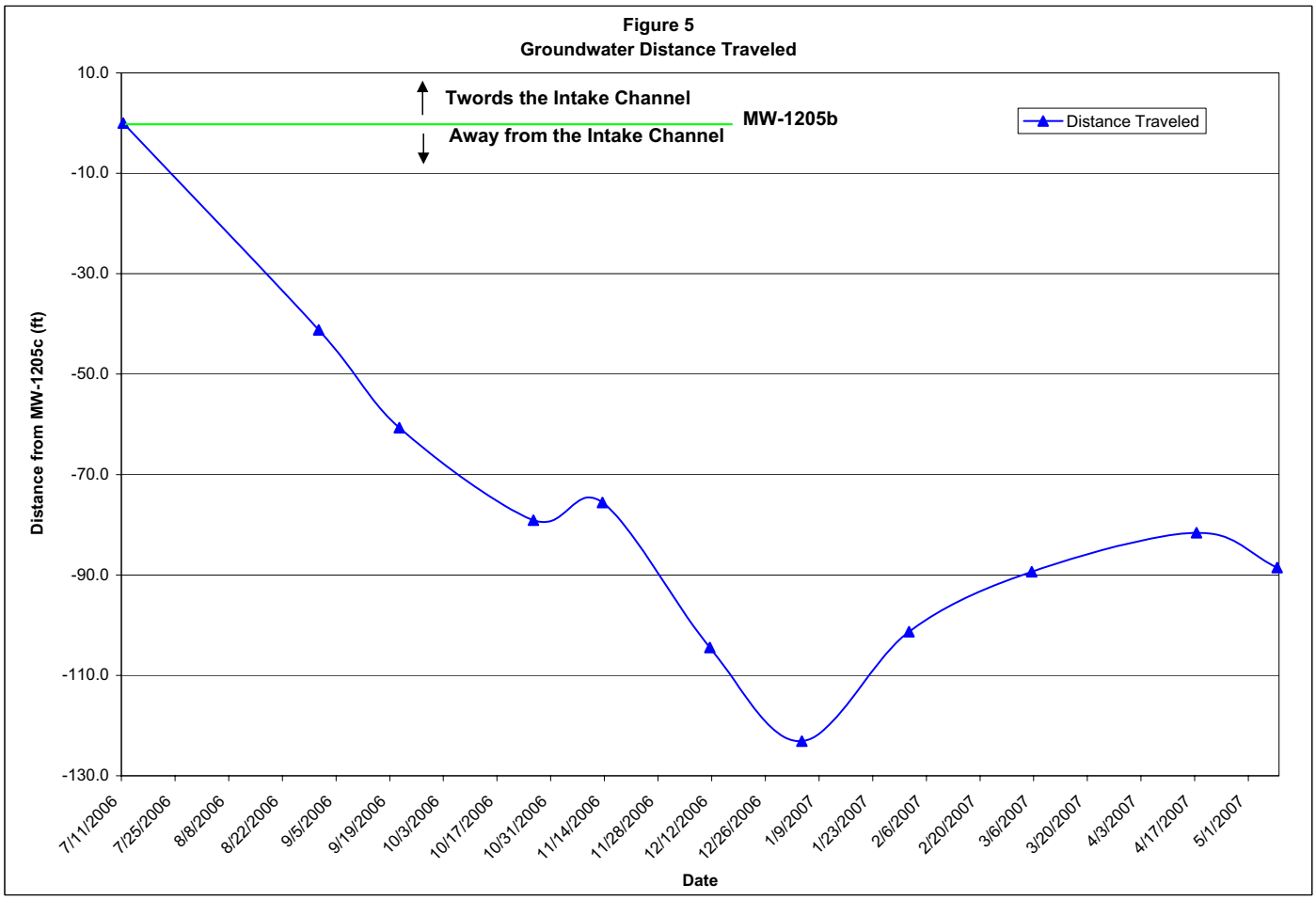


Figure 5
Groundwater Distance Traveled



TABLES

Table 1
Monthly Groundwater Hydraulic Gradient and Flow Velocity
BLN Unit #3 to Town Creek

Date		07/11/06	08/31/06	09/21/06	10/26/06	11/13/06	12/11/06	01/04/07	02/01/07	03/05/07	04/17/07	05/08/07
Elevation High (Eh)	**ft**	598.08	600.07	599.97	601.38	601.69	599.23	602.31	602.14	602.09	601.94	600.84
Elevation Low (El)	**ft**	595.18	594.65	593.94	594.51	594.68	593.98	594.94	594.11	594.06	594.57	594.81
Hydraulic Gradient (Eh-El)/L	**ft/ft**	1.81E-03	3.39E-03	3.77E-03	4.29E-03	4.38E-03	3.28E-03	4.61E-03	5.02E-03	5.02E-03	4.61E-03	3.77E-03
Velocity (V)	**ft/day**	1.20	2.24	2.49	2.84	2.90	2.17	3.05	3.32	3.32	3.05	2.49
Travel Time (T)	**days**	1335	714	642	563	552	737	525	482	482	525	642
	yrs	3.65	1.96	1.76	1.54	1.51	2.02	1.44	1.32	1.32	1.44	1.76
Pathway Distance (L)	**ft**	1,600										
Hydraulic Conductivity (Kh)	**cm/sec**	4.20E-03										
	ft/sec	1.38E-04										
	ft/day	11.9055										
porosity (η)		0.018										

Assumptions: Hydraulic gradient is between MW-1217b (Eh) and SW-4 Town Creek Embayment surface (El)
Equation for Velocity: V = (Kh (Eh-El)/L)/η Darcy equation for Average Linear Velocity
Equations for Travel Time: T = L/V
Conversions: 1day = 86,400 seconds; 1 foot = 30.48 centimeters; 1 year = 365.25 days

Average GW Velocity	ft/day	2.64
Average GW Travel Time	days	654.51
	yrs	1.79

Table 2
Change in Velocity due to Change in Porosity with Depth
BLN Unit #3 to Town Creek

Date		07/11/06	08/31/06	09/21/06	10/26/06	11/13/06	12/11/06	01/04/07	02/01/07	03/05/07	04/17/07	05/08/07
Elevation High (Eh)	**ft**	598.08	600.07	599.97	601.38	601.69	599.23	602.31	602.14	602.09	601.94	600.84
Elevation Low (El)	**ft**	595.18	594.65	593.94	594.51	594.68	593.98	594.94	594.11	594.06	594.57	594.81
Hydraulic Gradient (Eh-El)/L	**ft/ft**	1.81E-03	3.39E-03	3.77E-03	4.29E-03	4.38E-03	3.28E-03	4.61E-03	5.02E-03	5.02E-03	4.61E-03	3.77E-03
Velocity (V)												
η = 0.014	**ft/day**	1.54	2.88	3.20	3.65	3.73	2.79	3.92	4.27	4.27	3.92	3.20
η = 0.021	**ft/day**	1.03	1.92	2.14	2.43	2.48	1.86	2.61	2.85	2.85	2.61	2.14
η = 0.018	**ft/day**	1.20	2.24	2.49	2.84	2.90	2.17	3.05	3.32	3.32	3.05	2.49
η = 0.013	**ft/day**	1.66	3.10	3.45	3.93	4.01	3.00	4.22	4.60	4.60	4.22	3.45
Travel Time (T)												
η = 0.014	**yrs**	2.84	1.52	1.37	1.20	1.18	1.57	1.12	1.03	1.03	1.12	1.37
η = 0.021	**yrs**	4.26	2.28	2.05	1.80	1.76	2.35	1.68	1.54	1.54	1.68	2.05
η = 0.018	**yrs**	3.65	1.96	1.76	1.54	1.51	2.02	1.44	1.32	1.32	1.44	1.76
η = 0.013	**yrs**	2.64	1.41	1.27	1.11	1.09	1.46	1.04	0.95	0.95	1.04	1.27

Pathway Distance (L)	**ft**	1,600
Hydraulic Conductivity (Kh)	**cm/sec**	4.20E-03
	ft/sec	1.38E-04
	ft/day	11.9055
porosity (η)		
Top 5 ft of rock		0.014
Top 10 ft of rock		0.021
Top 20 ft of rock		0.018
Top 30 ft of rock		0.013

Assumptions: Hydraulic gradient is between MW-1217b (Eh) and SW-4 Town Creek Embayment surface (El)
Equation for Velocity: V = (Kh (Eh-El)/L)/n Darcy equation for Average Linear Velocity
Equations for Travel Time: T = L/V
Conversions: 1day = 86,400 seconds; 1 foot = 30.48 centimeters; 1 year = 365.25 days

Table 3
Average Monthly Change in Groundwater Velocity
due to Change in Porosity and Hydraulic Conductivity
BLN Unit #3 to Town Creek

Date			07/11/06	08/31/06	09/21/06	10/26/06	11/13/06	12/11/06	01/04/07	02/01/07	03/05/07	04/17/07	05/08/07
Elevation High (Eh)	**ft**		**598.08**	**600.07**	**599.97**	**601.38**	**601.69**	**599.23**	**602.31**	**602.14**	**602.09**	**601.94**	**600.84**
Elevation Low (El)	**ft**		**595.18**	**594.65**	**593.94**	**594.51**	**594.68**	**593.98**	**594.94**	**594.11**	**594.06**	**594.57**	**594.81**
Hydraulic Gradient (Eh-El)/L	**ft/ft**		1.81E-03	3.39E-03	3.77E-03	4.29E-03	4.38E-03	3.28E-03	4.61E-03	5.02E-03	5.02E-03	4.61E-03	3.77E-03
						Hydraulic Conductivity (cm/sec)							
Velocity (V) (ft/day)			**3.90E-03**	**4.00E-03**	**4.10E-03**	**4.20E-03**	**4.30E-03**	**4.40E-03**	**4.50E-03**				
	porosity (n)	**0.015**	2.94	3.02	3.10	3.17	3.25	3.32	3.40				
		0.016	2.76	2.83	2.90	2.97	3.04	3.11	3.18				
		0.017	2.60	2.66	2.73	2.80	2.86	2.93	3.00				
		0.018	2.45	2.52	2.58	2.64	2.71	2.77	2.83				
		0.019	2.32	2.38	2.44	2.50	2.56	2.62	2.68				
		0.020	2.21	2.26	2.32	2.38	2.43	2.49	2.55				
		0.021	2.10	2.16	2.21	2.26	2.32	2.37	2.43				
Pathway Distance (L)	**ft**		**1,600**										
Hydraulic Conductivity (Kh)	**cm/sec**		**3.90E-03**	**4.00E-03**	**4.10E-03**	**4.20E-03**	**4.30E-03**	**4.40E-03**	**4.50E-03**				
	ft/sec		1.28E-04	1.31E-04	1.35E-04	1.38E-04	1.41E-04	1.44E-04	1.48E-04				
	ft/day		11.0551	11.3386	11.6220	11.9055	12.1890	12.4724	12.7559				

Assumptions: Hydraulic gradient is between MW-1217b (Eh) and SW-4 Town Creek Embayment surface (El)
Equation for Velocity: V = (Kh (Eh-El)/L)/n Darcy equation for Average Linear Velocity
Equations for Travel Time: T = L/V
Conversions: 1day = 86,400 seconds; 1 foot = 30.48 centimeters; 1 year = 365.25 days

Table 4
Monthly Groundwater Hydraulic Gradient and Flow Velocity
BLN Unit #4 to Intake Channel

Date		07/11/06	08/31/06	09/21/06	10/26/06	11/13/06	12/11/06	01/04/07	02/01/07	03/05/07	04/17/07	05/08/07
Elevation High (Eh)	**ft**	**608.10**	**608.57**	**608.05**	**610.58**	**610.48**	**607.99**	**612.15**	**609.99**	**610.25**	**610.40**	**608.28**
Elevation Low (El)	**ft**	**595.07**	**593.69**	**593.97**	**594.37**	**594.58**	**594.17**	**594.70**	**594.09**	**593.95**	**594.55**	**594.66**
Hydraulic Gradient (Eh-El)/L	**ft**	5.01E-03	5.72E-03	5.42E-03	6.23E-03	6.12E-03	5.32E-03	6.71E-03	6.12E-03	6.27E-03	6.10E-03	5.24E-03
Velocity (V)	**ft/day**	3.31	3.79	3.58	4.12	4.04	3.52	4.44	4.04	4.15	4.03	3.46
Travel Time (T)	**days**	784	687	726	631	643	740	586	643	627	645	750
	yrs	2.15	1.88	1.99	1.73	1.76	2.02	1.60	1.76	1.72	1.77	2.05
Pathway Distance (L)	**ft**	**2,600**										
Hydraulic Conductivity (Kh)	**cm/sec**	4.20E-03										
	ft/sec	1.38E-04										
	ft/day	11.906										
porosity (η)		0.018										

Assumptions: Hydraulic gradient is between MW-1204c (Eh) and SW-2 Intake Structure surface (El)
Equation for Velocity: V = (Kh (Eh-El)/L)/n Darcy equation for Average Linear Velocity
Equations for Travel Time: T = L/V
Conversions: 1day = 86,400 seconds; 1 foot = 30.48 centimeters; 1 year = 365.25 days

Average GW Velocity	**ft/day**	3.86
Average GW Travel Time	**days**	678.25
	yrs	1.86

Table 5
Groundwater Travel Distance from MW-1205c to MW-1211c

Date		07/11/06	08/31/06	09/21/06	10/26/06	11/13/06	12/11/06	01/04/07	02/01/07	03/05/07	04/17/07	05/08/07
Elevation High (Eh)	**ft**	607.14	607.95	606.91	611.15	610.98	607.18	612.90	611.61	610.59	610.59	607.41
Elevation Low (El)	**ft**	608.55	608.81	608.66	610.88	610.70	610.36	611.91	610.41	610.74	609.93	609.00
Hydraulic Gradient (Eh-El)/L	**ft**	-1.52E-03	-9.25E-04	-1.88E-03	2.90E-04	3.01E-04	-3.42E-03	1.06E-03	1.29E-03	-1.61E-04	7.10E-04	-1.71E-03
Days			51	21	35	18	28	24	28	32	43	21
Velocity (V)	**ft/day**	-1.00	-0.61	-1.24	0.19	0.20	-2.26	0.70	0.85	-0.11	0.47	-1.13
Distance Traveled	**ft**	0.0	-41.2	-19.5	-18.4	3.5	-28.9	-18.7	21.8	11.9	7.8	-6.9
Total Distance Traveled	**ft**	0.0	-41.2	-60.7	-79.1	-75.6	-104.4	-123.1	-101.3	-89.4	-81.6	-88.5

Pathway Distance (L)	**ft**	930
Hydraulic Conductivity (Kh)	**cm/sec**	4.20E-03
	ft/sec	1.38E-04
	ft/day	11.906
porosity (η)		0.018

Assumptions: Hydraulic gradient is between MW-1205c (Eh) and MW-1211c (El)
Negative values denote groundwater flow from MW-1211c twords MW-1205c.
Pathway distance is from MW-1205c to MW-1211c (930 feet).
Equation for Velocity: V = (Kh (Eh-El)/L)/n Darcy equation for Average Linear Velocity
Equations for Travel Time: T = L/V
Conversions: 1day = 86,400 seconds; 1 foot = 30.48 centimeters; 1 year = 365.25 days
Assupmtion for Total Distance Traveled is that groundwater velocity changes linearly from one interval to the next interval.

ATTACHMENT A

Borehole	Interval (bgs)		Average Depth Below TOR (ft)	Thickness (ft)	Cavity Description and Drilling Notes
	Top	Bottom			
B-1001	13.4	14	1.1	0.8	Clay-filled cavity. Clay (10 YR 5/6), wet, stiff, medium plasticity, sand to gravel sized limestone clasts.
	15.4	16.1	6	0.85	Clay-filled cavity
	17.8	19.1	6	1.5	Clay-filled cavity
	19.8	20.5	8.4	0.8	Clay-filled cavity
	20.6	21	9.3	0.5	Clay-filled cavity. Rod drop 20.5-21.6. 21' water circulation lost, did not recover.
B-1002	27.8	28	11.4	0.2	Cavity. Poor to moderate fluid returns 51-120.5' bgs.
	33.4	33.5	16.9	0.1	Cavity. Poor to moderate fluid returns 51-120.5' bgs.
B-1008	18.3	20.5	6.4	2.2	Clay filled cavity. Lost water circulation 18.3-21.3' and 36.4-121.3' bgs. 90% water loss.
	23.9	24	10.9	0.1	Clay-filled cavity
B-1027	17.4	17.7	5.2	0.3	Cavity. Water circulation lost at 17'. Poor fluid return until 50' bgs.
B-1033	14.1	14.2	1.6	0.1	Clay-filled cavity.
	14.6	14.7	2.1	0.1	Clay-filled cavity.
	19	19.2	6.6	0.2	Clay-filled cavity.
	19.3	19.5	6.8	0.2	Clay-filled cavity.
	19.7	19.9	7.2	0.2	Clay-filled cavity.
	30.1	30.2	17.6	0.1	Clay-filled cavity.
B-1036	18	18.1	2	0.1	Clay-filled cavity. Water circulation lost. 20.8-22' and 40.1' bgs to the bottom of the boring.
	18.2	18.3	2.2	0.1	Clay-filled cavity.
B-1038	17.9	18	5.2	0.1	Clay filled cavity.
B-1044	15.2	15.4	7.3	0.2	Cavity. Rod drop during drilling of ~1' at 15.2' bgs.
	63	63.1	55	0.1	Cavity.
B-1046	27.8	27.9	4.3	0.1	Calcareous clay infilled cavity. Lost water circulation at 25.4' bgs.
B-1050	16.2	16.9	1.7	0.7	Clay filled cavity. No water circulation throughout boring.
	17.5	17.7	2.8	0.2	Clay filled cavity. No water circulation throughout boring.
	18.8	19	4.1	0.2	Clay filled cavity. No water circulation throughout boring.
B-1052	44.2	44.5	18.1	0.3	Cavity. No water circulation throughout boring.
	44.7	45.5	18.9	0.8	Cavity. No water circulation throughout boring.
	59.2	60.8	33.8	1.6	Clay filled cavity; (7.5YR 4/8), highly plastic.
B-1065	20.1	20.6	2.8	0.5	Clay-filled cavity.
	24.4	24.5	6.9	0.1	Clay-filled cavity.
	27.7	27.9	10.3	0.2	Clay-filled cavity.
B-1066	20.2	20.4	10.8	0.2	Clay-filled cavity. No water circulation throughout boring.
B-1069	31.3	31.4	22	0.1	Clay-filled cavity. Water circulation lost for first 26' bgs.
	33.4	33.5	24.1	0.1	Clay-filled cavity.
	34.5	34.6	25.2	0.1	Clay-filled cavity.
	37.5	37.6	28.2	0.1	Clay-filled cavity.
	38.2	38.3	28.9	0.1	Clay-filled cavity.
B-1070	8.2	8.8	5.2	0.6	Clay-filled cavity.
B-1071	16.4	17.4	3.3	1	Soil-filled cavity. Rod drop at ~ 16' bgs. Water circulation lost at ~28' bgs.
B-1072	14.6	15.4	8.4	1.2	Soil-filled cavity.
	15.7	15.9	9	0.2	Soil-filled cavity.
	20.4	28.4	17.6	8	Soil-filled cavity.
	28.8	29.8	22.5	1	Soil-filled cavity. Water circulation lost at 45.5' bgs.
B-1074	16.3	17.6	11.2	1.3	Clay-filled cavity.
	20.1	21.8	15.2	1.6	Cavity.
	25	25.2	19.4	0.2	Cavity. Water circulation low at 26' bgs.
B-1076	12.6	16.6	6.3	4	Soil-filled cavity. Water circulation lost 13-50' bgs.
B-1077A	14.5	14.6	1	0.1	Clay-filled cavity.
B-1080	34.2	34.3	24.2	0.1	Clay-filled cavity. No water circulation throughout boring.
B-1082	10.8	12.9	4.3	2.1	Soil-filled cavity; medium stiff.
	13	16	7	3	Soil-filled, medium stiff
B-1093	11.5	11.6	1.7	0.1	Clay-filled cavity. Slight loss of water circulation.
	11.7	11.8	1.9	0.1	Clay-filled cavity. Slight loss of water circulation.
	12.6	12.7	2.8	0.1	Clay-filled cavity. Slight loss of water circulation.
	12.8	12.9	3	0.1	Clay-filled cavity. Slight loss of water circulation.
B-1094	12.2	12.3	1.2	0.1	Clay-filled cavity. Poor to no water circulation through 16' bgs.
B-1095	14.4	14.8	1.3	0.4	Soil-filled cavity; medium stiff.

Total rock core up to 20' into Rock
= 1974.8 Feet

Total Thickness of Cavities in top 20' of Rock (ft)
= 36.25 Feet

Total rock core up to 10' into Rock
= 1103.9 Feet

Total Thickness of Cavities in top 10' of Rock (ft) = 23.15

Total rock core up to 5' into Rock
= 508.5 Feet

Total Thickness of Cavities in top 5' of Rock (ft) = 7

Total rock core up to 30' into Rock
= 2813.4 Feet

Total Thickness of Cavities in top 30' of Rock (ft) = 37.85

Calculation for Percent Cavities in top 20 feet of rock

$$\frac{\text{Sum Cavitiy length in top 20' of Rock}}{\text{Sum Core length (20 unless less rock drilled)}} = \text{Porosity}$$

$$\frac{36.25}{1974.8} = 0.0184 \ \frac{\text{Cavities ft}}{\text{Rock Core ft}}$$

Calculation for Percent Cavities in top 10 feet of rock

$$\frac{\text{Sum Cavitiy length in top 10' of Rock}}{\text{Sum Core length (10 unless less rock drilled)}} = \text{Porosity}$$

$$\frac{23.15}{1103.9} = 0.021 \ \frac{\text{Cavities ft}}{\text{Rock Core ft}}$$

Calculation for Percent Cavities in top 5 feet of rock

$$\frac{\text{Sum Cavitiy length in top 5' of Rock}}{\text{Sum Core length (5 unless less rock drilled)}} = \text{Porosity}$$

$$\frac{7}{508.5} = 0.0138 \ \frac{\text{Cavities ft}}{\text{Rock Core ft}}$$

Calculation for Percent Cavities in top 30 feet of rock

$$\frac{\text{Sum Cavitiy length in top 30' of Rock}}{\text{Sum Core length (30 unless less rock drilled)}} = \text{Porosity}$$

$$\frac{37.85}{2814.3} = 0.0134 \ \frac{\text{Cavities ft}}{\text{Rock Core ft}}$$

ATTACHMENT B

GROUNDWATER AQUIFER TEST REPORT

BELLEFONTE NUCLEAR SITE
SCOTTSBORO, JACKSON COUNTY, ALABAMA

ENERCON Services Project #NUSTART006
Terra-Solve Project #06575

Prepared For:

ENERCON SERVICES, INC.
An Employee Owned Company

12100 Ford Road, Suite 200
Dallas, TX 75234
(972) 484-3854
(972) 484-8835 Fax

Prepared By: _____
Perry Evans, Consulting Hydrogeologist, Terra-Solve, Inc.

Approved By: _____
Randall Lantz, P.G. (AL #1164) Sr. Geologist

12/10/06

PUMPING TEST FIELD DATA
September 18 - 21, 2006
BELLEFONTE NUCLEAR SITE
SCOTTSBORO, JACKSON COUNTY, AL
TERRA-SOLVE PROJECT NO. 06575

TEST TYPE:	Variable Discharge
REFERENCE POINT:	TOC
STATIC DEPTH TO WATER:	19.29 feet
DEPTH TO PUMP INTAKE:	29.50 feet
WELL TOTAL DEPTH:	33.30 feet
WELL DIAMETER:	4 -inch
ASSOCIATED WITH PUMPING WELL:	MW-1217B
DISTANCE FROM PUMPING WELL:	0.0 feet
OBSERVATION WELL:	**MW-1217B**

Date	Time (min)	Depth to Water (feet)	Drawdown (feet)	Pumping Rate (gpm)
9/18/06 1:00 PM	0	19.29		
9/18/06 1:01 PM	1	23.04	3.75	1.23
9/18/06 1:02 PM	2	22.18	2.89	1.23
9/18/06 1:03 PM	3	22.38	3.09	1.23
9/18/06 1:04 PM	4	24.65	5.36	4.81
9/18/06 1:05 PM	5	24.56	5.27	7.37
9/18/06 1:06 PM	6	24.91	5.62	4.71
9/18/06 1:07 PM	7	25.06	5.77	4.40
9/18/06 1:08 PM	8	25.11	5.82	4.09
9/18/06 1:09 PM	9	25.08	5.79	4.09
9/18/06 1:10 PM	10	25.08	5.79	4.09
9/18/06 1:11 PM	11	25.11	5.82	3.99
9/18/06 1:12 PM	12	25.09	5.80	3.89
9/18/06 1:13 PM	13	25.08	5.79	4.40
9/18/06 1:14 PM	14	25.09	5.80	4.09
9/18/06 1:15 PM	15	25.09	5.80	4.20
9/18/06 1:20 PM	20	25.42	6.13	3.79
9/18/06 1:25 PM	25	25.48	6.19	3.81
9/18/06 1:30 PM	30	25.50	6.21	3.34
9/18/06 1:35 PM	35	25.52	6.23	3.40
9/18/06 1:40 PM	40	25.58	6.29	3.48
9/18/06 1:45 PM	45	26.62	7.33	2.84
9/18/06 1:50 PM	50	24.52	5.23	2.83
9/18/06 1:55 PM	55	25.72	6.43	3.91
9/18/06 2:00 PM	60	25.58	6.29	2.85
9/18/06 2:30 PM	90	23.85	4.56	2.91
9/18/06 3:00 PM	120	24.15	4.86	2.92
9/18/06 3:30 PM	150	24.33	5.04	2.92
9/18/06 4:00 PM	180	24.50	5.21	2.92
9/18/06 4:30 PM	210	24.75	5.46	2.92
9/18/06 5:00 PM	240	27.68	8.39	2.92
9/18/06 5:30 PM	270	27.68	8.39	2.91
9/18/06 6:00 PM	300	27.68	8.39	2.80
9/18/06 7:00 PM	360	24.14	4.85	2.46
9/18/06 8:00 PM	420	25.04	5.75	2.70
9/18/06 9:00 PM	480	25.60	6.31	2.68

September 18 - 21, 2006
BELLEFONTE NUCLEAR SITE
SCOTTSBORO, JACKSON COUNTY, AL
TERRA-SOLVE PROJECT NO. 06575

TEST TYPE:	Variable Discharge
REFERENCE POINT:	TOC
STATIC DEPTH TO WATER:	19.29 feet
DEPTH TO PUMP INTAKE:	29.50 feet
WELL TOTAL DEPTH:	33.30 feet
WELL DIAMETER:	4 -inch
ASSOCIATED WITH PUMPING WELL:	MW-1217B
DISTANCE FROM PUMPING WELL:	0.0 feet
OBSERVATION WELL:	**MW-1217B**

9/18/06 10:00 PM	540	27.68	8.39	2.67
9/18/06 11:00 PM	600	27.68	8.39	2.41
9/19/06 12:00 AM	660	27.68	8.39	2.30
9/19/06 1:00 AM	720	27.68	8.39	2.25
9/19/06 2:00 AM	780	27.68	8.39	2.45
9/19/06 3:00 AM	840	27.68	8.39	1.98
9/19/06 4:00 AM	900	27.68	8.39	2.13
9/19/06 5:00 AM	960	27.68	8.39	1.80
9/19/06 6:00 AM	1020	27.68	8.39	1.97
9/19/06 7:00 AM	1080	27.68	8.39	2.06
9/19/06 8:00 AM	1140	27.68	8.39	2.05
9/19/06 9:00 AM	1200	27.68	8.39	1.93
9/19/06 10:00 AM	1260	27.68	8.39	2.01
9/19/06 11:00 AM	1320	27.68	8.39	2.12
9/19/06 12:00 PM	1380	27.68	8.39	2.20
9/19/06 1:00 PM	1440	27.68	8.39	2.04
9/19/06 2:00 PM	1500	27.68	8.39	1.98
9/19/06 2:01 PM	1501	25.11	5.82	0
9/19/06 2:02 PM	1502	22.06	2.77	0
9/19/06 2:03 PM	1503	20.18	0.89	0
9/19/06 2:04 PM	1504	19.43	0.14	0
9/19/06 2:05 PM	1505	18.98	-0.31	0
9/19/06 2:06 PM	1506	18.80	-0.49	0
9/19/06 2:07 PM	1507	18.68	-0.61	0
9/19/06 2:08 PM	1508	18.63	-0.66	0
9/19/06 2:09 PM	1509	18.58	-0.71	0
9/19/06 2:10 PM	1510	18.56	-0.73	0
9/19/06 2:11 PM	1511	18.53	-0.76	0
9/19/06 2:12 PM	1512	18.52	-0.77	0
9/19/06 2:13 PM	1513	18.51	-0.78	0
9/19/06 2:14 PM	1514	18.50	-0.79	0
9/19/06 2:15 PM	1515	18.49	-0.80	0
9/19/06 2:20 PM	1520	18.43	-0.86	0
9/19/06 2:25 PM	1525	18.41	-0.88	0
9/19/06 2:30 PM	1530	18.38	-0.91	0
9/19/06 2:35 PM	1535	18.35	-0.94	0
9/19/06 2:40 PM	1540	18.33	-0.96	0
9/19/06 2:45 PM	1545	18.31	-0.98	0
9/19/06 2:50 PM	1550	18.29	-1.00	0

September 18 - 21, 2006
BELLEFONTE NUCLEAR SITE
SCOTTSBORO, JACKSON COUNTY, AL
TERRA-SOLVE PROJECT NO. 06575

TEST TYPE:	Variable Discharge
REFERENCE POINT:	TOC
STATIC DEPTH TO WATER:	19.29 feet
DEPTH TO PUMP INTAKE:	29.50 feet
WELL TOTAL DEPTH:	33.30 feet
WELL DIAMETER:	4 -inch
ASSOCIATED WITH PUMPING WELL:	MW-1217B
DISTANCE FROM PUMPING WELL:	0.0 feet
OBSERVATION WELL:	**MW-1217B**

9/19/06 2:55 PM	1555	18.28	-1.01	0
9/19/06 3:00 PM	1560	18.26	-1.03	0
9/19/06 3:30 PM	1590	18.17	-1.12	0
9/19/06 4:00 PM	1620	18.09	-1.20	0
9/19/06 4:30 PM	1650	18.03	-1.26	0
9/19/06 5:00 PM	1680	17.99	-1.30	0
9/20/06 8:12 AM	2592	17.38	-1.91	0
9/20/06 2:51 PM	2991	17.21	-2.08	0
9/21/06 8:21 AM	4041	17.13	-2.16	0

Pump off after 1500 minutes.

PUMPING TEST FIELD DATA
September 18 - 21, 2006
BELLEFONTE NUCLEAR SITE
SCOTTSBORO, JACKSON COUNTY, AL
TERRA-SOLVE PROJECT NO. 06575

TEST TYPE:	Variable Discharge
REFERENCE POINT:	TOC
STATIC DEPTH TO WATER:	46.61 feet
WELL TOTAL DEPTH:	52.80 feet
WELL DIAMETER:	4 -inch
ASSOCIATED WITH PUMPING WELL:	MW-1217B
DISTANCE FROM PUMPING WELL:	3.45 feet
OBSERVATION WELL:	**MW-1217C**

Date	Time (min)	Depth to Water (feet)	Drawdown (feet)
9/18/06 1:00 PM	0	46.61	
9/18/06 1:02 PM	2	46.61	0.00
9/18/06 1:04 PM	4	46.62	0.01
9/18/06 1:06 PM	6	46.62	0.01
9/18/06 1:08 PM	8	46.62	0.01
9/18/06 1:10 PM	10	46.62	0.01
9/18/06 1:12 PM	12	46.62	0.01
9/18/06 1:14 PM	14	46.62	0.01
9/18/06 1:16 PM	16	46.62	0.01
9/18/06 1:18 PM	18	46.62	0.01
9/18/06 1:20 PM	20	46.62	0.01
9/18/06 1:22 PM	22	46.62	0.01
9/18/06 1:24 PM	24	46.62	0.01
9/18/06 1:26 PM	26	46.62	0.01
9/18/06 1:28 PM	28	46.62	0.01
9/18/06 1:30 PM	30	46.62	0.01
9/18/06 1:32 PM	32	46.62	0.01
9/18/06 1:34 PM	34	46.62	0.01
9/18/06 1:36 PM	36	46.62	0.01
9/18/06 1:38 PM	38	46.62	0.01
9/18/06 1:40 PM	40	46.62	0.01
9/18/06 1:42 PM	42	46.62	0.01
9/18/06 1:44 PM	44	46.62	0.01
9/18/06 1:46 PM	46	46.62	0.01
9/18/06 1:48 PM	48	46.62	0.01
9/18/06 1:50 PM	50	46.62	0.01
9/18/06 1:52 PM	52	46.62	0.01
9/18/06 1:54 PM	54	46.62	0.01
9/18/06 1:56 PM	56	46.62	0.01
9/18/06 1:58 PM	58	46.62	0.01
9/18/06 2:00 PM	60	46.62	0.01
9/18/06 2:05 PM	65	46.62	0.01
9/18/06 2:30 PM	90	46.63	0.02
9/18/06 3:00 PM	120	46.63	0.02
9/18/06 3:30 PM	150	46.63	0.02
9/18/06 4:00 PM	180	46.63	0.02
9/18/06 4:30 PM	210	46.63	0.02
9/18/06 5:00 PM	240	46.63	0.02
9/18/06 5:30 PM	270	46.63	0.02
9/18/06 6:00 PM	300	46.63	0.02

September 18 - 21, 2006
BELLEFONTE NUCLEAR SITE
SCOTTSBORO, JACKSON COUNTY, AL
TERRA-SOLVE PROJECT NO. 06575

TEST TYPE:	Variable Discharge
REFERENCE POINT:	TOC
STATIC DEPTH TO WATER:	46.61 feet
WELL TOTAL DEPTH:	52.80 feet
WELL DIAMETER:	4 -inch
ASSOCIATED WITH PUMPING WELL:	MW-1217B
DISTANCE FROM PUMPING WELL:	3.45 feet
OBSERVATION WELL:	**MW-1217C**

9/18/06 6:30 PM	330	46.63	0.02
9/18/06 7:00 PM	360	46.63	0.02
9/18/06 8:00 PM	420	46.63	0.02
9/18/06 9:00 PM	480	46.63	0.02
9/18/06 10:00 PM	540	46.63	0.02
9/18/06 11:00 PM	600	46.62	0.01
9/19/06 12:00 AM	660	46.63	0.02
9/19/06 1:00 AM	720	46.62	0.01
9/19/06 2:00 AM	780	46.62	0.01
9/19/06 3:00 AM	840	46.62	0.01
9/19/06 4:00 AM	900	46.61	0.00
9/19/06 5:00 AM	960	46.59	-0.02
9/19/06 6:00 AM	1020	46.62	0.01
9/19/06 7:00 AM	1080	46.62	0.01
9/19/06 8:00 AM	1140	46.62	0.01
9/19/06 9:00 AM	1200	46.62	0.01
9/19/06 10:00 AM	1260	46.62	0.01
9/19/06 11:00 AM	1320	46.62	0.01
9/19/06 12:00 PM	1380	46.62	0.01
9/19/06 1:00 PM	1440	46.62	0.01
9/19/06 2:00 PM	1500	46.62	0.01
9/19/06 2:02 PM	1502	46.62	0.01
9/19/06 2:04 PM	1504	46.62	0.01
9/19/06 2:06 PM	1506	46.62	0.01
9/19/06 2:08 PM	1508	46.62	0.01
9/19/06 2:10 PM	1510	46.62	0.01
9/19/06 2:12 PM	1512	46.62	0.01
9/19/06 2:14 PM	1514	46.62	0.01
9/19/06 2:16 PM	1516	46.62	0.01
9/19/06 2:18 PM	1518	46.62	0.01
9/19/06 2:20 PM	1520	46.62	0.01
9/19/06 2:22 PM	1522	46.62	0.01
9/19/06 2:24 PM	1524	46.61	0.00
9/19/06 2:26 PM	1526	46.61	0.00
9/19/06 2:28 PM	1528	46.61	0.00
9/19/06 2:30 PM	1530	46.61	0.00
9/19/06 2:32 PM	1532	46.61	0.00
9/19/06 2:34 PM	1534	46.61	0.00
9/19/06 2:36 PM	1536	46.61	0.00
9/19/06 2:38 PM	1538	46.61	0.00
9/19/06 2:40 PM	1540	46.61	0.00
9/19/06 2:42 PM	1542	46.61	0.00
9/19/06 2:44 PM	1544	46.61	0.00

September 18 - 21, 2006
BELLEFONTE NUCLEAR SITE
SCOTTSBORO, JACKSON COUNTY, AL
TERRA-SOLVE PROJECT NO. 06575

TEST TYPE:	Variable Discharge
REFERENCE POINT:	TOC
STATIC DEPTH TO WATER:	46.61 feet
WELL TOTAL DEPTH:	52.80 feet
WELL DIAMETER:	4 -inch
ASSOCIATED WITH PUMPING WELL:	MW-1217B
DISTANCE FROM PUMPING WELL:	3.45 feet
OBSERVATION WELL:	**MW-1217C**

9/19/06 2:46 PM	1546	46.61	0.00
9/19/06 2:48 PM	1548	46.61	0.00
9/19/06 2:50 PM	1550	46.61	0.00
9/19/06 2:52 PM	1552	46.61	0.00
9/19/06 2:54 PM	1554	46.61	0.00
9/19/06 2:56 PM	1556	46.61	0.00
9/19/06 2:58 PM	1558	46.61	0.00
9/19/06 3:00 PM	1560	46.61	0.00
9/19/06 3:05 PM	1565	46.61	0.00
9/19/06 3:10 PM	1570	46.61	0.00
9/19/06 3:15 PM	1575	46.61	0.00
9/19/06 3:20 PM	1580	46.61	0.00
9/19/06 3:25 PM	1585	46.61	0.00
9/19/06 3:30 PM	1590	46.61	0.00
9/19/06 3:35 PM	1595	46.61	0.00
9/19/06 3:40 PM	1600	46.61	0.00
9/19/06 3:45 PM	1605	46.61	0.00
9/19/06 3:50 PM	1610	46.61	0.00
9/19/06 3:55 PM	1615	46.61	0.00
9/19/06 4:00 PM	1620	46.61	0.00
9/19/06 4:10 PM	1630	46.61	0.00
9/19/06 4:20 PM	1640	46.61	0.00
9/19/06 4:30 PM	1650	46.61	0.00
9/19/06 4:40 PM	1660	46.61	0.00
9/19/06 4:50 PM	1670	46.61	0.00
9/19/06 5:00 PM	1680	46.61	0.00
9/20/06 8:11 AM	2591	46.61	0.00
9/20/06 2:50 PM	2990	46.61	0.00
9/21/06 8:19 AM	4039	46.61	0.00

Pump off after 1500 minutes.

PUMPING TEST FIELD DATA
September 18 - 21, 2006
BELLEFONTE NUCLEAR SITE
SCOTTSBORO, JACKSON COUNTY, AL
TERRA-SOLVE PROJECT NO. 06575

TEST TYPE:	Variable Discharge
REFERENCE POINT:	TOC
STATIC DEPTH TO WATER:	77.37 feet
WELL TOTAL DEPTH:	77.81 feet
WELL DIAMETER:	2 -inch
ASSOCIATED WITH PUMPING WELL:	MW-1217B
DISTANCE FROM PUMPING WELL:	186.10 feet
OBSERVATION WELL:	**MW-1201B**

Date	Time (min)	Depth to Water (feet)	Drawdown (feet)
9/18/06 1:00 PM	0	77.37	
9/19/06 8:00 AM	1140	77.31	-0.06
9/19/06 1:00 PM	1440	77.31	-0.06
9/19/06 2:00 PM	1500	77.31	-0.06
9/19/06 3:30 PM	1590	77.31	-0.06
9/21/06 8:13 AM	4033	77.33	-0.04

Pump off after 1500 minutes.

PUMPING TEST FIELD DATA
September 18 - 21, 2006
BELLEFONTE NUCLEAR SITE
SCOTTSBORO, JACKSON COUNTY, AL
TERRA-SOLVE PROJECT NO. 06575

TEST TYPE:	Variable Discharge
REFERENCE POINT:	TOC
STATIC DEPTH TO WATER:	46.55 feet
WELL TOTAL DEPTH:	52.85 feet
WELL DIAMETER:	2 -inch
ASSOCIATED WITH PUMPING WELL:	MW-1217B
DISTANCE FROM PUMPING WELL:	46.00 feet
OBSERVATION WELL:	**OW-7**

Date	Time (min)	Depth to Water (feet)	Drawdown (feet)
9/18/06 1:00 PM	0	46.55	
9/18/06 1:02 PM	2	46.55	0.00
9/18/06 1:04 PM	4	46.55	0.00
9/18/06 1:06 PM	6	46.55	0.00
9/18/06 1:08 PM	8	46.55	0.00
9/18/06 1:10 PM	10	46.55	0.00
9/18/06 1:12 PM	12	46.55	0.00
9/18/06 1:14 PM	14	46.55	0.00
9/18/06 1:16 PM	16	46.55	0.00
9/18/06 1:18 PM	18	46.55	0.00
9/18/06 1:20 PM	20	46.55	0.00
9/18/06 1:22 PM	22	46.55	0.00
9/18/06 1:24 PM	24	46.55	0.00
9/18/06 1:26 PM	26	46.55	0.00
9/18/06 1:28 PM	28	46.55	0.00
9/18/06 1:30 PM	30	46.55	0.00
9/18/06 1:32 PM	32	46.55	0.00
9/18/06 1:34 PM	34	46.55	0.00
9/18/06 1:36 PM	36	46.55	0.00
9/18/06 1:38 PM	38	46.55	0.00
9/18/06 1:40 PM	40	46.55	0.00
9/18/06 1:42 PM	42	46.55	0.00
9/18/06 1:44 PM	44	46.55	0.00
9/18/06 1:46 PM	46	46.55	0.00
9/18/06 1:48 PM	48	46.55	0.00
9/18/06 1:50 PM	50	46.55	0.00
9/18/06 1:52 PM	52	46.55	0.00
9/18/06 1:54 PM	54	46.55	0.00
9/18/06 1:56 PM	56	46.55	0.00
9/18/06 1:58 PM	58	46.55	0.00
9/18/06 2:00 PM	60	46.55	0.00
9/18/06 2:05 PM	65	46.55	0.00
9/18/06 2:10 PM	70	46.55	0.00
9/18/06 2:15 PM	75	46.55	0.00
9/18/06 2:20 PM	80	46.55	0.00
9/18/06 2:25 PM	85	46.55	0.00
9/18/06 2:30 PM	90	46.55	0.00
9/18/06 3:00 PM	120	46.55	0.00
9/18/06 3:30 PM	150	46.55	0.00
9/18/06 4:00 PM	180	46.55	0.00

September 18 - 21, 2006
BELLEFONTE NUCLEAR SITE
SCOTTSBORO, JACKSON COUNTY, AL
TERRA-SOLVE PROJECT NO. 06575

TEST TYPE:	Variable Discharge
REFERENCE POINT:	TOC
STATIC DEPTH TO WATER:	46.55 feet
WELL TOTAL DEPTH:	52.85 feet
WELL DIAMETER:	2 -inch
ASSOCIATED WITH PUMPING WELL:	MW-1217B
DISTANCE FROM PUMPING WELL:	46.00 feet
OBSERVATION WELL:	**OW-7**

9/18/06 4:30 PM	210	46.55	0.00
9/18/06 5:00 PM	240	46.55	0.00
9/18/06 5:30 PM	270	46.55	0.00
9/18/06 6:00 PM	300	46.55	0.00
9/18/06 6:30 PM	330	46.55	0.00
9/18/06 7:00 PM	360	46.55	0.00
9/18/06 8:00 PM	420	46.55	0.00
9/18/06 9:00 PM	480	46.55	0.00
9/18/06 10:00 PM	540	46.55	0.00
9/18/06 11:00 PM	600	46.55	0.00
9/19/06 12:00 AM	660	46.55	0.00
9/19/06 1:00 AM	720	46.55	0.00
9/19/06 2:00 AM	780	46.55	0.00
9/19/06 3:00 AM	840	46.55	0.00
9/19/06 4:00 AM	900	46.55	0.00
9/19/06 5:00 AM	960	46.55	0.00
9/19/06 6:00 AM	1020	46.55	0.00
9/19/06 7:00 AM	1080	46.55	0.00
9/19/06 8:00 AM	1140	46.55	0.00
9/19/06 9:00 AM	1200	46.55	0.00
9/19/06 10:00 AM	1260	46.55	0.00
9/19/06 11:00 AM	1320	46.55	0.00
9/19/06 12:00 PM	1380	46.55	0.00
9/19/06 1:00 PM	1440	46.55	0.00
9/19/06 2:00 PM	1500	46.55	0.00
9/19/06 2:02 PM	1502	46.55	0.00
9/19/06 2:04 PM	1504	46.55	0.00
9/19/06 2:06 PM	1506	46.55	0.00
9/19/06 2:08 PM	1508	46.55	0.00
9/19/06 2:10 PM	1510	46.55	0.00
9/19/06 2:12 PM	1512	46.55	0.00
9/19/06 2:14 PM	1514	46.55	0.00
9/19/06 2:16 PM	1516	46.56	0.01
9/19/06 2:18 PM	1518	46.56	0.01
9/19/06 2:20 PM	1520	46.56	0.01
9/19/06 2:22 PM	1522	46.56	0.01
9/19/06 2:24 PM	1524	46.56	0.01
9/19/06 2:26 PM	1526	46.56	0.01
9/19/06 2:28 PM	1528	46.57	0.02
9/19/06 2:30 PM	1530	46.57	0.02
9/19/06 2:32 PM	1532	46.57	0.02
9/19/06 2:34 PM	1534	46.57	0.02
9/19/06 2:36 PM	1536	46.57	0.02

September 18 - 21, 2006
BELLEFONTE NUCLEAR SITE
SCOTTSBORO, JACKSON COUNTY, AL
TERRA-SOLVE PROJECT NO. 06575

TEST TYPE:	Variable Discharge
REFERENCE POINT:	TOC
STATIC DEPTH TO WATER:	46.55 feet
WELL TOTAL DEPTH:	52.85 feet
WELL DIAMETER:	2 -inch
ASSOCIATED WITH PUMPING WELL:	MW-1217B
DISTANCE FROM PUMPING WELL:	46.00 feet
OBSERVATION WELL:	**OW-7**

9/19/06 2:38 PM	1538	46.57	0.02
9/19/06 2:40 PM	1540	46.57	0.02
9/19/06 2:42 PM	1542	46.57	0.02
9/19/06 2:44 PM	1544	46.57	0.02
9/19/06 2:46 PM	1546	46.57	0.02
9/19/06 2:48 PM	1548	46.57	0.02
9/19/06 2:50 PM	1550	46.57	0.02
9/19/06 2:52 PM	1552	46.57	0.02
9/19/06 2:54 PM	1554	46.57	0.02
9/19/06 2:56 PM	1556	46.57	0.02
9/19/06 2:58 PM	1558	46.57	0.02
9/19/06 3:00 PM	1560	46.57	0.02
9/19/06 3:05 PM	1565	46.57	0.02
9/19/06 3:10 PM	1570	46.57	0.02
9/19/06 3:15 PM	1575	46.57	0.02
9/19/06 3:20 PM	1580	46.57	0.02
9/19/06 3:25 PM	1585	46.57	0.02
9/19/06 3:30 PM	1590	46.57	0.02
9/19/06 3:35 PM	1595	46.57	0.02
9/19/06 3:40 PM	1600	46.57	0.02
9/19/06 3:45 PM	1605	46.57	0.02
9/19/06 3:50 PM	1610	46.57	0.02
9/19/06 3:55 PM	1615	46.57	0.02
9/19/06 4:00 PM	1620	46.57	0.02
9/19/06 4:10 PM	1630	46.57	0.02
9/19/06 4:20 PM	1640	46.57	0.02
9/19/06 4:30 PM	1650	46.57	0.02
9/19/06 4:40 PM	1660	46.57	0.02
9/19/06 4:50 PM	1670	46.57	0.02
9/19/06 5:00 PM	1680	46.57	0.02
9/20/06 8:10 AM	2590	46.57	0.02
9/20/06 2:43 PM	2983	46.54	-0.01
9/21/06 8:12 AM	4032	46.54	-0.01

Pump off after 1500 minutes.

PUMPING TEST FIELD DATA
September 18 - 21, 2006
BELLEFONTE NUCLEAR SITE
SCOTTSBORO, JACKSON COUNTY, AL
TERRA-SOLVE PROJECT NO. 06575

TEST TYPE:	Variable Discharge
REFERENCE POINT:	TOC
STATIC DEPTH TO WATER:	19.77 feet
WELL TOTAL DEPTH:	54.20 feet
WELL DIAMETER:	2 -inch
ASSOCIATED WITH PUMPING WELL:	MW-1217B
DISTANCE FROM PUMPING WELL:	58.20 feet
OBSERVATION WELL:	**OW-8**

Date	Time (min)	Depth to Water (feet)	Drawdown (feet)
9/18/06 1:00 PM	0	19.77	
9/18/06 1:02 PM	2	19.77	0.00
9/18/06 1:04 PM	4	19.77	0.00
9/18/06 1:06 PM	6	19.77	0.00
9/18/06 1:08 PM	8	19.77	0.00
9/18/06 1:10 PM	10	19.78	0.01
9/18/06 1:12 PM	12	19.79	0.02
9/18/06 1:14 PM	14	19.80	0.03
9/18/06 1:16 PM	16	19.81	0.04
9/18/06 1:18 PM	18	19.82	0.05
9/18/06 1:20 PM	20	19.82	0.05
9/18/06 1:22 PM	22	19.83	0.06
9/18/06 1:24 PM	24	19.83	0.06
9/18/06 1:26 PM	26	19.84	0.07
9/18/06 1:28 PM	28	19.84	0.07
9/18/06 1:30 PM	30	19.87	0.10
9/18/06 1:32 PM	32	19.87	0.10
9/18/06 1:34 PM	34	19.89	0.12
9/18/06 1:36 PM	36	19.89	0.12
9/18/06 1:38 PM	38	19.90	0.13
9/18/06 1:40 PM	40	19.90	0.13
9/18/06 1:42 PM	42	19.91	0.14
9/18/06 1:44 PM	44	19.92	0.15
9/18/06 1:46 PM	46	19.93	0.16
9/18/06 1:48 PM	48	19.94	0.17
9/18/06 1:50 PM	50	19.95	0.18
9/18/06 1:52 PM	52	19.95	0.18
9/18/06 1:54 PM	54	19.96	0.19
9/18/06 1:56 PM	56	19.97	0.20
9/18/06 1:58 PM	58	19.98	0.21
9/18/06 2:00 PM	60	19.99	0.22
9/18/06 2:05 PM	65	20.03	0.26
9/18/06 2:10 PM	70	20.05	0.28
9/18/06 2:15 PM	75	20.05	0.28
9/18/06 2:20 PM	80	20.07	0.30
9/18/06 2:25 PM	85	20.08	0.31
9/18/06 2:30 PM	90	20.10	0.33
9/18/06 3:00 PM	120	20.20	0.43
9/18/06 3:30 PM	150	20.28	0.51
9/18/06 4:00 PM	180	20.33	0.56

September 18 - 21, 2006
BELLEFONTE NUCLEAR SITE
SCOTTSBORO, JACKSON COUNTY, AL
TERRA-SOLVE PROJECT NO. 06575

TEST TYPE:	Variable Discharge
REFERENCE POINT:	TOC
STATIC DEPTH TO WATER:	19.77 feet
WELL TOTAL DEPTH:	54.20 feet
WELL DIAMETER:	2 -inch
ASSOCIATED WITH PUMPING WELL:	MW-1217B
DISTANCE FROM PUMPING WELL:	58.20 feet
OBSERVATION WELL:	**OW-8**

9/18/06 4:30 PM	210	20.37	0.60
9/18/06 5:00 PM	240	20.41	0.64
9/18/06 5:30 PM	270	20.43	0.66
9/18/06 6:00 PM	300	20.45	0.68
9/18/06 6:30 PM	330	20.45	0.68
9/18/06 7:00 PM	360	20.43	0.66
9/18/06 8:00 PM	420	20.41	0.64
9/18/06 9:00 PM	480	20.39	0.62
9/18/06 10:00 PM	540	20.36	0.59
9/18/06 11:00 PM	600	20.32	0.55
9/19/06 12:00 AM	660	20.25	0.48
9/19/06 1:00 AM	720	20.20	0.43
9/19/06 2:00 AM	780	20.13	0.36
9/19/06 3:00 AM	840	20.03	0.26
9/19/06 4:00 AM	900	19.98	0.21
9/19/06 5:00 AM	960	19.90	0.13
9/19/06 6:00 AM	1020	19.78	0.01
9/19/06 7:00 AM	1080	19.68	-0.09
9/19/06 8:00 AM	1140	19.60	-0.17
9/19/06 9:00 AM	1200	19.50	-0.27
9/19/06 10:00 AM	1260	19.45	-0.32
9/19/06 11:00 AM	1320	19.37	-0.40
9/19/06 12:00 PM	1380	19.32	-0.45
9/19/06 1:00 PM	1440	19.25	-0.52
9/19/06 2:00 PM	1500	19.19	-0.58
9/19/06 2:02 PM	1502	19.19	-0.58
9/19/06 2:04 PM	1504	19.19	-0.58
9/19/06 2:06 PM	1506	19.19	-0.58
9/19/06 2:08 PM	1508	19.19	-0.58
9/19/06 2:10 PM	1510	19.19	-0.58
9/19/06 2:12 PM	1512	19.19	-0.58
9/19/06 2:14 PM	1514	19.19	-0.58
9/19/06 2:16 PM	1516	19.16	-0.61
9/19/06 2:18 PM	1518	19.16	-0.61
9/19/06 2:20 PM	1520	19.15	-0.62
9/19/06 2:22 PM	1522	19.14	-0.63
9/19/06 2:24 PM	1524	19.13	-0.64
9/19/06 2:26 PM	1526	19.13	-0.64
9/19/06 2:28 PM	1528	19.12	-0.65
9/19/06 2:30 PM	1530	19.12	-0.65
9/19/06 2:32 PM	1532	19.11	-0.66
9/19/06 2:34 PM	1534	19.10	-0.67
9/19/06 2:36 PM	1536	19.09	-0.68

September 18 - 21, 2006
BELLEFONTE NUCLEAR SITE
SCOTTSBORO, JACKSON COUNTY, AL
TERRA-SOLVE PROJECT NO. 06575

TEST TYPE:	Variable Discharge
REFERENCE POINT:	TOC
STATIC DEPTH TO WATER:	19.77 feet
WELL TOTAL DEPTH:	54.20 feet
WELL DIAMETER:	2 -inch
ASSOCIATED WITH PUMPING WELL:	MW-1217B
DISTANCE FROM PUMPING WELL:	58.20 feet
OBSERVATION WELL:	**OW-8**

9/19/06 2:38 PM	1538	19.08	-0.69
9/19/06 2:40 PM	1540	19.08	-0.69
9/19/06 2:42 PM	1542	19.07	-0.70
9/19/06 2:44 PM	1544	19.06	-0.71
9/19/06 2:46 PM	1546	19.06	-0.71
9/19/06 2:48 PM	1548	19.05	-0.72
9/19/06 2:50 PM	1550	19.05	-0.72
9/19/06 2:52 PM	1552	19.04	-0.73
9/19/06 2:54 PM	1554	19.03	-0.74
9/19/06 2:56 PM	1556	19.02	-0.75
9/19/06 2:58 PM	1558	19.01	-0.76
9/19/06 3:00 PM	1560	19.00	-0.77
9/19/06 3:05 PM	1565	19.00	-0.77
9/19/06 3:10 PM	1570	18.98	-0.79
9/19/06 3:15 PM	1575	18.95	-0.82
9/19/06 3:20 PM	1580	18.94	-0.83
9/19/06 3:25 PM	1585	18.93	-0.84
9/19/06 3:30 PM	1590	18.91	-0.86
9/19/06 3:35 PM	1595	18.89	-0.88
9/19/06 3:40 PM	1600	18.87	-0.90
9/19/06 3:45 PM	1605	18.86	-0.91
9/19/06 3:50 PM	1610	18.86	-0.91
9/19/06 3:55 PM	1615	18.83	-0.94
9/19/06 4:00 PM	1620	18.81	-0.96
9/19/06 4:10 PM	1630	18.78	-0.99
9/19/06 4:20 PM	1640	18.74	-1.03
9/19/06 4:30 PM	1650	18.73	-1.04
9/19/06 4:40 PM	1660	18.70	-1.07
9/19/06 4:50 PM	1670	18.67	-1.10
9/19/06 5:00 PM	1680	18.64	-1.13
9/20/06 8:10 AM	2590	17.86	-1.91
9/20/06 2:54 PM	2994	17.68	-2.09
9/21/06 8:23 AM	4043	17.59	-2.18

Pump off after 1500 minutes.

PUMPING TEST FIELD DATA
September 18 - 21, 2006
BELLEFONTE NUCLEAR SITE
SCOTTSBORO, JACKSON COUNTY, AL
TERRA-SOLVE PROJECT NO. 06575

TEST TYPE:	Variable Discharge
REFERENCE POINT:	TOC
STATIC DEPTH TO WATER:	32.57 feet
WELL TOTAL DEPTH:	52.70 feet
WELL DIAMETER:	2 -inch
ASSOCIATED WITH PUMPING WELL:	MW-1217B
DISTANCE FROM PUMPING WELL:	69.30 feet
OBSERVATION WELL:	**OW-9**

Date	Time (min)	Depth to Water (feet)	Drawdown (feet)
9/18/06 1:00 PM	0	32.57	
9/18/06 1:18 PM	18	32.56	-0.01
9/18/06 1:25 PM	25	32.56	-0.01
9/18/06 1:36 PM	36	32.56	-0.01
9/18/06 1:40 PM	40	32.56	-0.01
9/18/06 1:46 PM	46	32.56	-0.01
9/18/06 2:00 PM	60	32.56	-0.01
9/18/06 2:10 PM	70	32.56	-0.01
9/18/06 2:15 PM	75	32.56	-0.01
9/18/06 2:25 PM	85	32.56	-0.01
9/18/06 2:30 PM	90	32.56	-0.01
9/18/06 3:00 PM	120	32.56	-0.01
9/18/06 3:30 PM	150	32.54	-0.03
9/18/06 4:00 PM	180	32.54	-0.03
9/18/06 4:30 PM	210	32.54	-0.03
9/18/06 5:00 PM	240	32.54	-0.03
9/18/06 5:30 PM	270	32.52	-0.05
9/18/06 6:00 PM	300	32.52	-0.05
9/18/06 6:30 PM	330	32.51	-0.06
9/18/06 7:00 PM	360	32.50	-0.07
9/18/06 8:00 PM	420	32.50	-0.07
9/18/06 9:00 PM	480	32.49	-0.08
9/18/06 10:00 PM	540	32.48	-0.09
9/18/06 11:00 PM	600	32.47	-0.10
9/19/06 12:00 AM	660	32.45	-0.12
9/19/06 1:00 AM	720	32.45	-0.12
9/19/06 2:00 AM	780	32.45	-0.12
9/19/06 3:00 AM	840	32.43	-0.14
9/19/06 4:00 AM	900	32.40	-0.17
9/19/06 5:00 AM	960	32.40	-0.17
9/19/06 6:00 AM	1020	32.40	-0.17
9/19/06 7:00 AM	1080	32.41	-0.16
9/19/06 8:00 AM	1140	32.40	-0.17
9/19/06 9:00 AM	1200	32.41	-0.16
9/19/06 10:00 AM	1260	32.41	-0.16
9/19/06 11:00 AM	1320	32.40	-0.17
9/19/06 12:00 PM	1380	32.40	-0.17
9/19/06 1:00 PM	1440	32.36	-0.21
9/19/06 2:00 PM	1500	32.35	-0.22
9/19/06 2:02 PM	1502	32.34	-0.23

September 18 - 21, 2006
BELLEFONTE NUCLEAR SITE
SCOTTSBORO, JACKSON COUNTY, AL
TERRA-SOLVE PROJECT NO. 06575

TEST TYPE:	Variable Discharge
REFERENCE POINT:	TOC
STATIC DEPTH TO WATER:	32.57 feet
WELL TOTAL DEPTH:	52.70 feet
WELL DIAMETER:	2 -inch
ASSOCIATED WITH PUMPING WELL:	MW-1217B
DISTANCE FROM PUMPING WELL:	69.30 feet
OBSERVATION WELL:	**OW-9**

9/19/06 2:04 PM	1504	32.34	-0.23
9/19/06 2:06 PM	1506	32.34	-0.23
9/19/06 2:08 PM	1508	32.34	-0.23
9/19/06 2:10 PM	1510	32.34	-0.23
9/19/06 2:12 PM	1512	32.34	-0.23
9/19/06 2:14 PM	1514	32.34	-0.23
9/19/06 2:16 PM	1516	32.34	-0.23
9/19/06 2:18 PM	1518	32.34	-0.23
9/19/06 2:20 PM	1520	32.34	-0.23
9/19/06 2:22 PM	1522	32.34	-0.23
9/19/06 2:24 PM	1524	32.34	-0.23
9/19/06 2:26 PM	1526	32.34	-0.23
9/19/06 2:28 PM	1528	32.34	-0.23
9/19/06 2:30 PM	1530	32.34	-0.23
9/19/06 2:32 PM	1532	32.34	-0.23
9/19/06 2:34 PM	1534	32.34	-0.23
9/19/06 2:36 PM	1536	32.34	-0.23
9/19/06 2:38 PM	1538	32.34	-0.23
9/19/06 2:40 PM	1540	32.34	-0.23
9/19/06 2:42 PM	1542	32.34	-0.23
9/19/06 2:44 PM	1544	32.34	-0.23
9/19/06 2:46 PM	1546	32.34	-0.23
9/19/06 2:48 PM	1548	32.34	-0.23
9/19/06 2:50 PM	1550	32.34	-0.23
9/19/06 2:52 PM	1552	32.34	-0.23
9/19/06 2:54 PM	1554	32.33	-0.24
9/19/06 2:56 PM	1556	32.33	-0.24
9/19/06 2:58 PM	1558	32.33	-0.24
9/19/06 3:00 PM	1560	32.33	-0.24
9/19/06 3:05 PM	1565	32.33	-0.24
9/19/06 3:10 PM	1570	32.33	-0.24
9/19/06 3:15 PM	1575	32.33	-0.24
9/19/06 3:20 PM	1580	32.33	-0.24
9/19/06 3:25 PM	1585	32.33	-0.24
9/19/06 3:30 PM	1590	32.33	-0.24
9/19/06 3:35 PM	1595	32.32	-0.25
9/19/06 3:40 PM	1600	32.32	-0.25
9/19/06 3:45 PM	1605	32.32	-0.25
9/19/06 3:50 PM	1610	32.32	-0.25
9/19/06 3:55 PM	1615	32.32	-0.25
9/19/06 4:00 PM	1620	32.32	-0.25
9/19/06 4:10 PM	1630	32.32	-0.25
9/19/06 4:20 PM	1640	32.31	-0.26

September 18 - 21, 2006
BELLEFONTE NUCLEAR SITE
SCOTTSBORO, JACKSON COUNTY, AL
TERRA-SOLVE PROJECT NO. 06575

TEST TYPE:	Variable Discharge
REFERENCE POINT:	TOC
STATIC DEPTH TO WATER:	32.57 feet
WELL TOTAL DEPTH:	52.70 feet
WELL DIAMETER:	2 -inch
ASSOCIATED WITH PUMPING WELL:	MW-1217B
DISTANCE FROM PUMPING WELL:	69.30 feet
OBSERVATION WELL:	**OW-9**

9/19/06 4:30 PM	1650	32.31	-0.26
9/19/06 4:40 PM	1660	32.31	-0.26
9/19/06 4:50 PM	1670	32.31	-0.26
9/19/06 5:00 PM	1680	32.31	-0.26
9/20/06 8:10 AM	2590	32.20	-0.37
9/20/06 2:48 PM	2988	32.09	-0.48
9/21/06 8:17 AM	4037	31.95	-0.62

Pump off after 1500 minutes.

PUMPING TEST FIELD DATA
September 18 - 21, 2006
BELLEFONTE NUCLEAR SITE
SCOTTSBORO, JACKSON COUNTY, AL
TERRA-SOLVE PROJECT NO. 06575

TEST TYPE:	Variable Discharge
REFERENCE POINT:	TOC
STATIC DEPTH TO WATER:	19.65 feet
WELL TOTAL DEPTH:	33.45 feet
WELL DIAMETER:	2 -inch
ASSOCIATED WITH PUMPING WELL:	MW-1217B
DISTANCE FROM PUMPING WELL:	77.00 feet
OBSERVATION WELL:	**OW-10**

Date	Time (min)	Depth to Water (feet)	Drawdown (feet)
9/18/06 1:00 PM	0	19.65	
9/18/06 1:15 PM	15	19.66	0.01
9/18/06 1:26 PM	26	19.66	0.01
9/18/06 1:34 PM	34	19.66	0.01
9/18/06 1:40 PM	40	19.66	0.01
9/18/06 1:46 PM	46	19.66	0.01
9/18/06 2:00 PM	60	19.66	0.01
9/18/06 2:10 PM	70	19.66	0.01
9/18/06 2:15 PM	75	19.66	0.01
9/18/06 2:20 PM	80	19.66	0.01
9/18/06 2:25 PM	85	19.61	-0.04
9/18/06 2:30 PM	90	19.62	-0.03
9/18/06 3:00 PM	120	19.62	-0.03
9/18/06 3:30 PM	150	19.62	-0.03
9/18/06 4:00 PM	180	19.62	-0.03
9/18/06 4:30 PM	210	19.62	-0.03
9/18/06 5:00 PM	240	19.62	-0.03
9/18/06 5:30 PM	270	19.62	-0.03
9/18/06 6:00 PM	300	19.62	-0.03
9/18/06 6:30 PM	330	19.62	-0.03
9/18/06 7:00 PM	360	19.62	-0.03
9/18/06 8:00 PM	420	19.62	-0.03
9/18/06 9:00 PM	480	19.62	-0.03
9/18/06 10:00 PM	540	19.61	-0.04
9/18/06 11:00 PM	600	19.61	-0.04
9/19/06 12:00 AM	660	19.59	-0.06
9/19/06 1:00 AM	720	19.60	-0.05
9/19/06 2:00 AM	780	19.59	-0.06
9/19/06 3:00 AM	840	19.59	-0.06
9/19/06 4:00 AM	900	19.58	-0.07
9/19/06 5:00 AM	960	19.59	-0.06
9/19/06 6:00 AM	1020	19.59	-0.06
9/19/06 7:00 AM	1080	19.59	-0.06
9/19/06 8:00 AM	1140	19.60	-0.05
9/19/06 9:00 AM	1200	19.61	-0.04
9/19/06 10:00 AM	1260	19.61	-0.04
9/19/06 11:00 AM	1320	19.61	-0.04
9/19/06 12:00 PM	1380	19.61	-0.04
9/19/06 1:00 PM	1440	19.58	-0.07
9/19/06 2:00 PM	1500	19.56	-0.09

September 18 - 21, 2006
BELLEFONTE NUCLEAR SITE
SCOTTSBORO, JACKSON COUNTY, AL
TERRA-SOLVE PROJECT NO. 06575

TEST TYPE:	Variable Discharge
REFERENCE POINT:	TOC
STATIC DEPTH TO WATER:	19.65 feet
WELL TOTAL DEPTH:	33.45 feet
WELL DIAMETER:	2 -inch
ASSOCIATED WITH PUMPING WELL:	MW-1217B
DISTANCE FROM PUMPING WELL:	77.00 feet
OBSERVATION WELL:	**OW-10**

9/19/06 2:02 PM	1502	19.55	-0.10
9/19/06 2:04 PM	1504	19.55	-0.10
9/19/06 2:06 PM	1506	19.55	-0.10
9/19/06 2:08 PM	1508	19.56	-0.09
9/19/06 2:10 PM	1510	19.56	-0.09
9/19/06 2:12 PM	1512	19.56	-0.09
9/19/06 2:14 PM	1514	19.56	-0.09
9/19/06 2:16 PM	1516	19.56	-0.09
9/19/06 2:18 PM	1518	19.56	-0.09
9/19/06 2:20 PM	1520	19.56	-0.09
9/19/06 2:22 PM	1522	19.56	-0.09
9/19/06 2:24 PM	1524	19.57	-0.08
9/19/06 2:26 PM	1526	19.56	-0.09
9/19/06 2:28 PM	1528	19.56	-0.09
9/19/06 2:30 PM	1530	19.56	-0.09
9/19/06 2:32 PM	1532	19.57	-0.08
9/19/06 2:34 PM	1534	19.57	-0.08
9/19/06 2:36 PM	1536	19.57	-0.08
9/19/06 2:38 PM	1538	19.57	-0.08
9/19/06 2:40 PM	1540	19.57	-0.08
9/19/06 2:42 PM	1542	19.57	-0.08
9/19/06 2:44 PM	1544	19.57	-0.08
9/19/06 2:46 PM	1546	19.57	-0.08
9/19/06 2:48 PM	1548	19.57	-0.08
9/19/06 2:50 PM	1550	19.57	-0.08
9/19/06 2:52 PM	1552	19.57	-0.08
9/19/06 2:54 PM	1554	19.57	-0.08
9/19/06 2:56 PM	1556	19.57	-0.08
9/19/06 2:58 PM	1558	19.57	-0.08
9/19/06 3:00 PM	1560	19.57	-0.08
9/19/06 3:05 PM	1565	19.57	-0.08
9/19/06 3:10 PM	1570	19.57	-0.08
9/19/06 3:15 PM	1575	19.57	-0.08
9/19/06 3:20 PM	1580	19.57	-0.08
9/19/06 3:25 PM	1585	19.57	-0.08
9/19/06 3:30 PM	1590	19.57	-0.08
9/19/06 3:35 PM	1595	19.56	-0.09
9/19/06 3:40 PM	1600	19.55	-0.10
9/19/06 3:45 PM	1605	19.55	-0.10
9/19/06 3:50 PM	1610	19.55	-0.10
9/19/06 3:55 PM	1615	19.55	-0.10
9/19/06 4:00 PM	1620	19.55	-0.10
9/19/06 4:10 PM	1630	19.55	-0.10

September 18 - 21, 2006
BELLEFONTE NUCLEAR SITE
SCOTTSBORO, JACKSON COUNTY, AL
TERRA-SOLVE PROJECT NO. 06575

TEST TYPE:	Variable Discharge
REFERENCE POINT:	TOC
STATIC DEPTH TO WATER:	19.65 feet
WELL TOTAL DEPTH:	33.45 feet
WELL DIAMETER:	2 -inch
ASSOCIATED WITH PUMPING WELL:	MW-1217B
DISTANCE FROM PUMPING WELL:	77.00 feet
OBSERVATION WELL:	**OW-10**

9/19/06 4:20 PM	1640	19.55	-0.10
9/19/06 4:30 PM	1650	19.55	-0.10
9/19/06 4:40 PM	1660	19.54	-0.11
9/19/06 4:50 PM	1670	19.54	-0.11
9/19/06 5:00 PM	1680	19.54	-0.11
9/20/06 8:10 AM	2590	19.43	-0.22
9/20/06 2:47 PM	2987	19.34	-0.31
9/21/06 8:16 AM	4036	19.24	-0.41

Pump off after 1500 minutes.

PUMPING TEST FIELD DATA
September 18 - 21, 2006
BELLEFONTE NUCLEAR SITE
SCOTTSBORO, JACKSON COUNTY, AL
TERRA-SOLVE PROJECT NO. 06575

TEST TYPE:	Variable Discharge
REFERENCE POINT:	TOC
STATIC DEPTH TO WATER:	18.10 feet
WELL TOTAL DEPTH:	32.92 feet
WELL DIAMETER:	2 -inch
ASSOCIATED WITH PUMPING WELL:	MW-1217B
DISTANCE FROM PUMPING WELL:	90.50 feet
OBSERVATION WELL:	**OW-11**

Date	Time (min)	Depth to Water (feet)	Drawdown (feet)
9/18/06 1:00 PM	0	18.10	
9/18/06 1:02 PM	2	18.10	0.00
9/18/06 1:04 PM	4	18.10	0.00
9/18/06 1:06 PM	6	18.10	0.00
9/18/06 1:08 PM	8	18.10	0.00
9/18/06 1:10 PM	10	18.10	0.00
9/18/06 1:12 PM	12	18.10	0.00
9/18/06 1:14 PM	14	18.10	0.00
9/18/06 1:16 PM	16	18.10	0.00
9/18/06 1:18 PM	18	18.10	0.00
9/18/06 1:20 PM	20	18.10	0.00
9/18/06 1:22 PM	22	18.10	0.00
9/18/06 1:24 PM	24	18.10	0.00
9/18/06 1:26 PM	26	18.10	0.00
9/18/06 1:28 PM	28	18.11	0.01
9/18/06 1:30 PM	30	18.11	0.01
9/18/06 1:32 PM	32	18.12	0.02
9/18/06 1:34 PM	34	18.12	0.02
9/18/06 1:36 PM	36	18.12	0.02
9/18/06 1:38 PM	38	18.12	0.02
9/18/06 1:40 PM	40	18.12	0.02
9/18/06 1:42 PM	42	18.12	0.02
9/18/06 1:44 PM	44	18.13	0.03
9/18/06 1:46 PM	46	18.13	0.03
9/18/06 1:48 PM	48	18.13	0.03
9/18/06 1:50 PM	50	18.13	0.03
9/18/06 1:52 PM	52	18.13	0.03
9/18/06 1:54 PM	54	18.13	0.03
9/18/06 1:56 PM	56	18.14	0.04
9/18/06 1:58 PM	58	18.14	0.04
9/18/06 2:00 PM	60	18.14	0.04
9/18/06 2:05 PM	65	18.14	0.04
9/18/06 2:10 PM	70	18.15	0.05
9/18/06 2:15 PM	75	18.15	0.05
9/18/06 2:20 PM	80	18.15	0.05
9/18/06 2:25 PM	85	18.16	0.06
9/18/06 2:30 PM	90	18.16	0.06
9/18/06 3:00 PM	120	18.20	0.10
9/18/06 3:30 PM	150	18.23	0.13
9/18/06 4:00 PM	180	18.25	0.15

September 18 - 21, 2006
BELLEFONTE NUCLEAR SITE
SCOTTSBORO, JACKSON COUNTY, AL
TERRA-SOLVE PROJECT NO. 06575

TEST TYPE:	Variable Discharge
REFERENCE POINT:	TOC
STATIC DEPTH TO WATER:	18.10 feet
WELL TOTAL DEPTH:	32.92 feet
WELL DIAMETER:	2 -inch
ASSOCIATED WITH PUMPING WELL:	MW-1217B
DISTANCE FROM PUMPING WELL:	90.50 feet
OBSERVATION WELL:	**OW-11**

9/18/06 4:30 PM	210	18.28	0.18
9/18/06 5:00 PM	240	18.31	0.21
9/18/06 5:30 PM	270	18.33	0.23
9/18/06 6:00 PM	300	18.35	0.25
9/18/06 6:30 PM	330	18.35	0.25
9/18/06 7:00 PM	360	18.39	0.29
9/18/06 8:00 PM	420	18.41	0.31
9/18/06 9:00 PM	480	18.42	0.32
9/18/06 10:00 PM	540	18.44	0.34
9/18/06 11:00 PM	600	18.46	0.36
9/19/06 12:00 AM	660	18.43	0.33
9/19/06 1:00 AM	720	18.43	0.33
9/19/06 2:00 AM	780	18.43	0.33
9/19/06 3:00 AM	840	18.43	0.33
9/19/06 4:00 AM	900	18.43	0.33
9/19/06 5:00 AM	960	18.43	0.33
9/19/06 6:00 AM	1020	18.43	0.33
9/19/06 7:00 AM	1080	18.38	0.28
9/19/06 8:00 AM	1140	18.36	0.26
9/19/06 9:00 AM	1200	18.32	0.22
9/19/06 10:00 AM	1260	18.31	0.21
9/19/06 11:00 AM	1320	18.29	0.19
9/19/06 12:00 PM	1380	18.26	0.16
9/19/06 1:00 PM	1440	18.23	0.13
9/19/06 2:00 PM	1500	18.21	0.11
9/19/06 2:02 PM	1502	18.21	0.11
9/19/06 2:04 PM	1504	18.21	0.11
9/19/06 2:06 PM	1506	18.20	0.10
9/19/06 2:08 PM	1508	18.20	0.10
9/19/06 2:10 PM	1510	18.20	0.10
9/19/06 2:12 PM	1512	18.20	0.10
9/19/06 2:14 PM	1514	18.20	0.10
9/19/06 2:16 PM	1516	18.19	0.09
9/19/06 2:18 PM	1518	18.19	0.09
9/19/06 2:20 PM	1520	18.18	0.08
9/19/06 2:22 PM	1522	18.18	0.08
9/19/06 2:24 PM	1524	18.18	0.08
9/19/06 2:26 PM	1526	18.18	0.08
9/19/06 2:28 PM	1528	18.17	0.07
9/19/06 2:30 PM	1530	18.17	0.07
9/19/06 2:32 PM	1532	18.17	0.07
9/19/06 2:34 PM	1534	18.17	0.07
9/19/06 2:36 PM	1536	18.16	0.06

September 18 - 21, 2006
BELLEFONTE NUCLEAR SITE
SCOTTSBORO, JACKSON COUNTY, AL
TERRA-SOLVE PROJECT NO. 06575

TEST TYPE:	Variable Discharge
REFERENCE POINT:	TOC
STATIC DEPTH TO WATER:	18.10 feet
WELL TOTAL DEPTH:	32.92 feet
WELL DIAMETER:	2 -inch
ASSOCIATED WITH PUMPING WELL:	MW-1217B
DISTANCE FROM PUMPING WELL:	90.50 feet
OBSERVATION WELL:	**OW-11**

9/19/06 2:38 PM	1538	18.16	0.06
9/19/06 2:40 PM	1540	18.16	0.06
9/19/06 2:42 PM	1542	18.16	0.06
9/19/06 2:44 PM	1544	18.16	0.06
9/19/06 2:46 PM	1546	18.16	0.06
9/19/06 2:48 PM	1548	18.15	0.05
9/19/06 2:50 PM	1550	18.15	0.05
9/19/06 2:52 PM	1552	18.15	0.05
9/19/06 2:54 PM	1554	18.15	0.05
9/19/06 2:56 PM	1556	18.14	0.04
9/19/06 2:58 PM	1558	18.14	0.04
9/19/06 3:00 PM	1560	18.14	0.04
9/19/06 3:05 PM	1565	18.12	0.02
9/19/06 3:10 PM	1570	18.12	0.02
9/19/06 3:15 PM	1575	18.11	0.01
9/19/06 3:20 PM	1580	18.11	0.01
9/19/06 3:25 PM	1585	18.11	0.01
9/19/06 3:30 PM	1590	18.10	0.00
9/19/06 3:35 PM	1595	18.10	0.00
9/19/06 3:40 PM	1600	18.09	-0.01
9/19/06 3:45 PM	1605	18.09	-0.01
9/19/06 3:50 PM	1610	18.08	-0.02
9/19/06 3:55 PM	1615	18.08	-0.02
9/19/06 4:00 PM	1620	18.06	-0.04
9/19/06 4:10 PM	1630	18.06	-0.04
9/19/06 4:20 PM	1640	18.06	-0.04
9/19/06 4:30 PM	1650	18.06	-0.04
9/19/06 4:40 PM	1660	18.06	-0.04
9/19/06 4:50 PM	1670	18.05	-0.05
9/19/06 5:00 PM	1680	18.05	-0.05
9/20/06 8:13 AM	2593	17.67	-0.43
9/20/06 2:44 PM	2984	17.38	-0.72
9/21/06 8:15 AM	4035	17.06	-1.04

Pump off after 1500 minutes.

PUMPING TEST FIELD DATA
September 18 - 21, 2006
BELLEFONTE NUCLEAR SITE
SCOTTSBORO, JACKSON COUNTY, AL
TERRA-SOLVE PROJECT NO. 06575

TEST TYPE:	Variable Discharge
REFERENCE POINT:	TOC
STATIC DEPTH TO WATER:	19.42 feet
WELL TOTAL DEPTH:	32.95 feet
WELL DIAMETER:	2 -inch
ASSOCIATED WITH PUMPING WELL:	MW-1217B
DISTANCE FROM PUMPING WELL:	78.60 feet
OBSERVATION WELL:	**OW-12**

Date	Time (min)	Depth to Water (feet)	Drawdown (feet)
9/18/06 1:00 PM	0	19.42	
9/18/06 1:02 PM	2	19.42	0.00
9/18/06 1:04 PM	4	19.42	0.00
9/18/06 1:06 PM	6	19.42	0.00
9/18/06 1:08 PM	8	19.42	0.00
9/18/06 1:10 PM	10	19.42	0.00
9/18/06 1:12 PM	12	19.42	0.00
9/18/06 1:14 PM	14	19.44	0.02
9/18/06 1:16 PM	16	19.45	0.03
9/18/06 1:18 PM	18	19.46	0.04
9/18/06 1:20 PM	20	19.46	0.04
9/18/06 1:22 PM	22	19.47	0.05
9/18/06 1:24 PM	24	19.48	0.06
9/18/06 1:26 PM	26	19.49	0.07
9/18/06 1:28 PM	28	19.50	0.08
9/18/06 1:30 PM	30	19.50	0.08
9/18/06 1:32 PM	32	19.51	0.09
9/18/06 1:34 PM	34	19.51	0.09
9/18/06 1:36 PM	36	19.52	0.10
9/18/06 1:38 PM	38	19.52	0.10
9/18/06 1:40 PM	40	19.53	0.11
9/18/06 1:42 PM	42	19.54	0.12
9/18/06 1:44 PM	44	19.55	0.13
9/18/06 1:46 PM	46	19.56	0.14
9/18/06 1:48 PM	48	19.57	0.15
9/18/06 1:50 PM	50	19.58	0.16
9/18/06 1:52 PM	52	19.58	0.16
9/18/06 1:54 PM	54	19.58	0.16
9/18/06 1:56 PM	56	19.60	0.18
9/18/06 1:58 PM	58	19.60	0.18
9/18/06 2:00 PM	60	19.61	0.19
9/18/06 2:05 PM	65	19.63	0.21
9/18/06 2:10 PM	70	19.65	0.23
9/18/06 2:15 PM	75	19.68	0.26
9/18/06 2:20 PM	80	19.69	0.27
9/18/06 2:25 PM	85	19.71	0.29
9/18/06 2:30 PM	90	19.72	0.30
9/18/06 3:00 PM	120	19.83	0.41
9/18/06 3:30 PM	150	19.90	0.48
9/18/06 4:00 PM	180	19.95	0.53

September 18 - 21, 2006
BELLEFONTE NUCLEAR SITE
SCOTTSBORO, JACKSON COUNTY, AL
TERRA-SOLVE PROJECT NO. 06575

TEST TYPE:	Variable Discharge
REFERENCE POINT:	TOC
STATIC DEPTH TO WATER:	19.42 feet
WELL TOTAL DEPTH:	32.95 feet
WELL DIAMETER:	2 -inch
ASSOCIATED WITH PUMPING WELL:	MW-1217B
DISTANCE FROM PUMPING WELL:	78.60 feet
OBSERVATION WELL:	**OW-12**

9/18/06 4:30 PM	210	19.99	0.57
9/18/06 5:00 PM	240	20.03	0.61
9/18/06 5:30 PM	270	20.09	0.67
9/18/06 6:00 PM	300	20.10	0.68
9/18/06 6:30 PM	330	20.10	0.68
9/18/06 7:00 PM	360	20.11	0.69
9/18/06 8:00 PM	420	20.11	0.69
9/18/06 9:00 PM	480	20.11	0.69
9/18/06 10:00 PM	540	20.09	0.67
9/18/06 11:00 PM	600	20.03	0.61
9/19/06 12:00 AM	660	19.98	0.56
9/19/06 1:00 AM	720	19.94	0.52
9/19/06 2:00 AM	780	19.87	0.45
9/19/06 3:00 AM	840	19.81	0.39
9/19/06 4:00 AM	900	19.73	0.31
9/19/06 5:00 AM	960	19.65	0.23
9/19/06 6:00 AM	1020	19.56	0.14
9/19/06 7:00 AM	1080	19.48	0.06
9/19/06 8:00 AM	1140	19.40	-0.02
9/19/06 9:00 AM	1200	19.30	-0.12
9/19/06 10:00 AM	1260	19.25	-0.17
9/19/06 11:00 AM	1320	19.16	-0.26
9/19/06 12:00 PM	1380	19.11	-0.31
9/19/06 1:00 PM	1440	19.04	-0.38
9/19/06 2:00 PM	1500	18.97	-0.45
9/19/06 2:02 PM	1502	18.97	-0.45
9/19/06 2:04 PM	1504	18.97	-0.45
9/19/06 2:06 PM	1506	18.97	-0.45
9/19/06 2:08 PM	1508	18.97	-0.45
9/19/06 2:10 PM	1510	18.95	-0.47
9/19/06 2:12 PM	1512	18.95	-0.47
9/19/06 2:14 PM	1514	18.95	-0.47
9/19/06 2:16 PM	1516	18.94	-0.48
9/19/06 2:18 PM	1518	18.94	-0.48
9/19/06 2:20 PM	1520	18.93	-0.49
9/19/06 2:22 PM	1522	18.92	-0.50
9/19/06 2:24 PM	1524	18.92	-0.50
9/19/06 2:26 PM	1526	18.91	-0.51
9/19/06 2:28 PM	1528	18.91	-0.51
9/19/06 2:30 PM	1530	18.89	-0.53
9/19/06 2:32 PM	1532	18.89	-0.53
9/19/06 2:34 PM	1534	18.88	-0.54
9/19/06 2:36 PM	1536	18.88	-0.54

September 18 - 21, 2006
BELLEFONTE NUCLEAR SITE
SCOTTSBORO, JACKSON COUNTY, AL
TERRA-SOLVE PROJECT NO. 06575

TEST TYPE:	Variable Discharge
REFERENCE POINT:	TOC
STATIC DEPTH TO WATER:	19.42 feet
WELL TOTAL DEPTH:	32.95 feet
WELL DIAMETER:	2 -inch
ASSOCIATED WITH PUMPING WELL:	MW-1217B
DISTANCE FROM PUMPING WELL:	78.60 feet
OBSERVATION WELL:	**OW-12**

9/19/06 2:38 PM	1538	18.87	-0.55
9/19/06 2:40 PM	1540	18.86	-0.56
9/19/06 2:42 PM	1542	18.85	-0.57
9/19/06 2:44 PM	1544	18.84	-0.58
9/19/06 2:46 PM	1546	18.84	-0.58
9/19/06 2:48 PM	1548	18.83	-0.59
9/19/06 2:50 PM	1550	18.82	-0.60
9/19/06 2:52 PM	1552	18.81	-0.61
9/19/06 2:54 PM	1554	18.80	-0.62
9/19/06 2:56 PM	1556	18.80	-0.62
9/19/06 2:58 PM	1558	18.79	-0.63
9/19/06 3:00 PM	1560	18.78	-0.64
9/19/06 3:05 PM	1565	18.76	-0.66
9/19/06 3:10 PM	1570	18.75	-0.67
9/19/06 3:15 PM	1575	18.72	-0.70
9/19/06 3:20 PM	1580	18.70	-0.72
9/19/06 3:25 PM	1585	18.69	-0.73
9/19/06 3:30 PM	1590	18.67	-0.75
9/19/06 3:35 PM	1595	18.65	-0.77
9/19/06 3:40 PM	1600	18.64	-0.78
9/19/06 3:45 PM	1605	18.62	-0.80
9/19/06 3:50 PM	1610	18.61	-0.81
9/19/06 3:55 PM	1615	18.59	-0.83
9/19/06 4:00 PM	1620	18.57	-0.85
9/19/06 4:10 PM	1630	18.52	-0.90
9/19/06 4:20 PM	1640	18.51	-0.91
9/19/06 4:30 PM	1650	18.48	-0.94
9/19/06 4:40 PM	1660	18.45	-0.97
9/19/06 4:50 PM	1670	18.42	-1.00
9/19/06 5:00 PM	1680	18.40	-1.02
9/20/06 8:13 AM	2593	17.63	-1.79
9/20/06 2:42 PM	2982	17.49	-1.93
9/21/06 8:10 AM	4030	17.38	-2.04

Pump off after 1500 minutes.

Waterloo Hydrogeologic, Inc.
460 Philip Street - Suite 101
Waterloo, Ontario, Canada
Phone: +1 519 746 1798

Slug Test Data Report

Project: Bellefonte Nuclear Site Bail Test

Number: 06575

Client: ENERCON

Test Well:	**MW-1203B**	**Slug Test:**	**1203B BAIL TEST**
		Test Well:	MW-1203B
Depth to Static WL:	13.34 [ft]	Casing radius:	0.17 [ft]
Location:	Scottsboro, Jackson County, AL	Boring radius:	0.34 [ft]
Recorded by:	PWE	Screen length:	10 [ft]
Date:	9/20/2006	Aquifer Thickness:	19.21 [ft]

	Time [min]	Depth to WL [ft]	Drawdown [ft]
1	15	32.06	18.72
2	25	32.00	18.66
3	30	31.96	18.62
4	35	31.94	18.60
5	40	31.91	18.57
6	45	31.89	18.55
7	50	31.87	18.53
8	55	31.85	18.51
9	60	31.82	18.48
10	65	31.80	18.46
11	70	31.78	18.44
12	75	31.77	18.43
13	80	31.75	18.41
14	85	31.73	18.39
15	90	31.72	18.38
16	95	31.71	18.37
17	100	31.69	18.35
18	105	31.68	18.34
19	110	31.67	18.33
20	115	31.66	18.32
21	120	31.65	18.31
22	125	31.64	18.30
23	130	31.63	18.29
24	1090	30.37	17.03

In-Situ Inc. Troll 9000 Pro XP

Report generated: 9/21/2006 15:59:12
Report from file: ...\SN45065 2006-09-18 131417 bellefonte 1.bin
Win-Situ® Version 4.57.0.0

Serial number: 45065
Firmware Version 2
Unit name: Troll 9000

Test name: bellefonte 1

Test defined on: 9/17/2006 19:00:05
Test started on: 9/18/2006 13:14:17
Test stopped on: 9/19/2006 14:11:10

Data gathered using Linear testing
Time between data points: Seconds.
Number of data samples: 300

TOTAL DATA SAMPLES 300

Channel number [1]
Measurement type: Temperature
Channel name:

Channel number [3]
Measurement type: Barometric Pressure
Channel name:

Channel number [5]
Measurement type: Battery Voltage
Channel name:

Channel number [11]
Measurement type: ORP
Channel name:

Channel number [12]
Measurement type: pH
Channel name:

Channel number [25]
Measurement type: Dissolved Oxygen
Channel name:

Channel number [25]
Measurement type: Dissolved Oxygen %Saturation
Channel name:

Channel number [45]
Measurement type: Conductivity, Low Range
Channel name:

Date	Time	ET (sec)	Chan[1] Temperature Fahrenheit	Chan[3] Barometric Inches Hg	Chan[5] Battery Volts	Chan[11] ORP millivolts	Chan[12] pH pH	Chan[25] Clark DO microgram	Chan[25] Clark DO Sat %Saturation	Chan[45] Conductivity microSiemens/cm Actual Conductivity
9/18/2006	13:14:17	0	68.58	29.234	2.785	146	6.97	763	8.6871	1436.04
9/18/2006	13:19:17	300	68.51	29.352	2.785	137	6.98	574	6.5068	1434.28
9/18/2006	13:24:17	600	68.48	29.277	2.785	133	6.99	538	6.1123	1434.42
9/18/2006	13:29:17	900	68.45	29.233	2.811	130	6.99	569	6.4704	1435.09
9/18/2006	13:34:17	1200	68.42	29.208	2.811	127	7	597	6.7892	1433.43
9/18/2006	13:39:17	1500	68.41	29.202	2.811	126	7	604	6.877	1431.92
9/18/2006	13:44:17	1800	68.37	29.188	2.785	125	7	600	6.8336	1433.1
9/18/2006	13:49:17	2100	68.33	29.191	2.785	124	7	654	7.4384	1431.28
9/18/2006	13:54:17	2400	68.33	29.185	2.785	124	7	666	7.5783	1430.79
9/18/2006	13:59:17	2700	68.31	29.18	2.785	122	7	687	7.8134	1429.88
9/18/2006	14:04:17	3000	68.92	29.169	2.785	67	7.09	10659	121.8848	860.35
9/18/2006	14:09:17	3300	68.97	29.171	2.785	334	7.23	9472	108.0539	1.43
9/18/2006	14:14:17	3600	68.98	29.175	2.811	356	7.24	7378	84.1728	1.43
9/18/2006	14:19:17	3900	69.01	29.181	2.785	389	7.26	8072	92.0973	1.43
9/18/2006	14:24:17	4200	68.99	29.189	2.811	427	7.28	9342	106.5303	1.43
9/18/2006	14:29:17	4500	68.97	29.191	2.785	461	7.27	9403	107.1954	1.43
9/18/2006	14:34:17	4800	68.97	29.191	2.785	468	7.26	9399	107.1499	1.43
9/18/2006	14:39:17	5100	68.98	29.197	2.811	487	7.27	9405	107.2067	1.43
9/18/2006	14:44:17	5400	68.98	29.2	2.785	389	7.24	9385	106.9651	1.43
9/18/2006	14:49:17	5700	68.97	29.211	2.785	180	7.14	4727	53.9471	583.18
9/18/2006	14:54:17	6000	68.99	29.212	2.785	299	7.22	7586	86.4317	1.43
9/18/2006	14:59:17	6300	68.96	29.201	2.785	177	7.14	8083	92.282	582.53
9/18/2006	15:04:17	6600	68.96	29.219	2.811	153	7.14	8801	100.4136	581.88
9/18/2006	15:09:17	6900	68.97	29.22	2.759	144	7.14	8426	96.1415	581.31

Date	Time	ET (sec)	Chan[1] Temperature Fahrenheit	Chan[3] Barometric Inches Hg	Chan[5] Battery Volts	Chan[11] ORP millivolts	Chan[12] pH pH	Chan[25] Clark DO microgram	Chan[25] Clark DO Sat %Saturation	Chan[45] Conductivity microSiemens/cm Actual Conductivity
9/18/2006	15:14:17	7200	68.96	29.219	2.811	138	7.15	8053	91.8735	581.95
9/18/2006	15:19:17	7500	68.96	29.221	2.785	135	7.15	7693	87.7567	582.09
9/18/2006	15:24:17	7800	68.95	29.212	2.811	134	7.14	7337	83.7197	581.59
9/18/2006	15:29:17	8100	68.96	29.202	2.811	133	7.14	7020	80.1293	581.09
9/18/2006	15:34:17	8400	68.96	29.183	2.811	133	7.14	6718	76.7419	581.02
9/18/2006	15:39:17	8700	68.97	29.148	2.785	133	7.13	6440	73.6657	581.45
9/18/2006	15:44:17	9000	68.97	29.104	2.785	133	7.13	6168	70.6651	582.45
9/18/2006	15:49:17	9300	68.97	29.057	2.785	133	7.13	5928	68.0216	581.88
9/18/2006	15:54:17	9600	68.96	29.026	2.785	133	7.13	5721	65.7147	582.09
9/18/2006	15:59:17	9900	68.97	29.014	2.785	133	7.13	5510	63.3311	581.45
9/18/2006	16:04:17	10200	68.96	29.005	2.785	133	7.13	5313	61.072	580.23
9/18/2006	16:09:17	10500	68.96	29.003	2.785	133	7.13	5121	58.8643	579.8
9/18/2006	16:14:17	10800	68.96	29.006	2.811	134	7.13	4940	56.7857	579.87
9/18/2006	16:19:17	11100	68.96	29.008	2.785	134	7.13	4776	54.8941	579.51
9/18/2006	16:24:17	11400	68.97	29.008	2.811	134	7.13	4614	53.0386	579.51
9/18/2006	16:29:17	11700	68.96	29.009	2.785	135	7.13	4464	51.3016	579.51
9/18/2006	16:34:17	12000	68.96	29.01	2.785	135	7.13	4307	49.5029	580.23
9/18/2006	16:39:17	12300	68.95	29.013	2.785	137	7.13	4136	47.5229	579.66
9/18/2006	16:44:17	12600	68.96	29.013	2.785	137	7.14	3971	45.6289	579.51
9/18/2006	16:49:17	12900	68.95	29.016	2.785	137	7.13	3823	43.926	579.59
9/18/2006	16:54:17	13200	68.96	29.014	2.785	137	7.13	3674	42.2198	579.37
9/18/2006	16:59:17	13500	68.96	29.013	2.811	138	7.13	3546	40.7527	579.23
9/18/2006	17:04:17	13800	68.96	29.011	2.785	137	7.14	3434	39.4616	579.02
9/18/2006	17:09:17	14100	68.96	29.012	2.785	138	7.14	3338	38.3585	579.09
9/18/2006	17:14:17	14400	68.95	29.016	2.785	138	7.14	3246	37.2974	578.94
9/18/2006	17:19:17	14700	68.96	29.023	2.811	139	7.14	3161	36.3164	578.59
9/18/2006	17:24:17	15000	68.97	29.024	2.785	139	7.14	3084	35.4352	578.38
9/18/2006	17:29:17	15300	68.96	29.026	2.785	140	7.14	3017	34.6564	578.45
9/18/2006	17:34:17	15600	68.95	29.025	2.811	140	7.14	2954	33.9287	578.45
9/18/2006	17:39:17	15900	68.96	29.028	2.785	141	7.14	2889	33.1807	578.38
9/18/2006	17:44:17	16200	68.95	29.031	2.785	140	7.15	2830	32.4961	578.45
9/18/2006	17:49:17	16500	68.95	29.033	2.785	141	7.15	2770	31.8028	578.52
9/18/2006	17:54:17	16800	68.96	29.032	2.785	141	7.15	2709	31.109	578.59
9/18/2006	17:59:17	17100	68.95	29.031	2.785	142	7.15	2662	30.5643	578.24
9/18/2006	18:04:17	17400	68.94	29.027	2.785	143	7.15	2638	30.2956	578.02
9/18/2006	18:09:17	17700	68.95	29.024	2.759	138	7.15	2629	30.2024	577.81
9/18/2006	18:14:17	18000	68.93	29.023	2.785	137	7.15	2667	30.6291	577.6
9/18/2006	18:19:17	18300	68.92	29.024	2.785	137	7.14	3205	36.8026	577.67

Date	Time	ET (sec)	Chan[1] Temperature Fahrenheit	Chan[3] Barometric Inches Hg	Chan[5] Battery Volts	Chan[11] ORP millivolts	Chan[12] pH pH	Chan[25] Clark DO microgram	Chan[25] Clark DO Sat %Saturation	Chan[45] Conductivity microSiemens/cm Actual Conductivity
9/18/2006	18:24:17	18600	68.93	29.024	2.811	266	7.16	8806	100.934	1.47
9/18/2006	18:29:17	18900	68.95	29.022	2.785	298	7.17	6877	78.846	1.43
9/18/2006	18:34:17	19200	68.93	29.021	2.785	275	7.11	8280	94.9186	1.43
9/18/2006	18:39:17	19500	69.01	29.02	2.785	334	7.12	8299	95.2281	1.43
9/18/2006	18:44:17	19800	68.94	29.018	2.785	287	7	8279	94.9205	1.43
9/18/2006	18:49:17	20100	68.94	29.016	2.785	149	7.09	8225	94.3171	1.43
9/18/2006	18:54:17	20400	68.94	29.013	2.785	160	7.07	8162	93.6023	1.75
9/18/2006	18:59:17	20700	68.94	29.012	2.785	145	7.07	7988	91.62	2.34
9/18/2006	19:04:17	21000	68.94	29.01	2.811	207	7.05	7331	84.0858	2.08
9/18/2006	19:09:17	21300	68.99	29.01	2.785	181	7.08	4996	57.3339	1.43
9/18/2006	19:14:17	21600	68.96	29.007	2.811	169	7.14	7929	91.1313	575.64
9/18/2006	19:19:17	21900	68.96	29.004	2.785	165	7.14	7636	87.7806	575.07
9/18/2006	19:24:17	22200	68.96	29.001	2.785	163	7.14	7219	82.9943	574.92
9/18/2006	19:29:17	22500	68.97	28.999	2.785	162	7.15	6821	78.4293	574.36
9/18/2006	19:34:17	22800	68.97	28.997	2.785	161	7.15	6455	74.2347	574.08
9/18/2006	19:39:17	23100	68.98	28.994	2.785	160	7.15	6110	70.2791	573.45
9/18/2006	19:44:17	23400	69.04	28.99	2.785	158	7.16	5674	65.3225	584.47
9/18/2006	19:49:17	23700	68.96	28.985	2.811	157	7.15	5321	61.2034	574.43
9/18/2006	19:54:17	24000	68.96	28.981	2.811	157	7.14	5007	57.6093	574.15
9/18/2006	19:59:17	24300	68.96	28.979	2.785	157	7.13	4728	54.3928	573.52
9/18/2006	20:04:17	24600	68.95	28.977	2.811	156	7.14	4484	51.5942	573.24
9/18/2006	20:09:17	24900	68.95	28.974	2.785	156	7.14	4260	49.0188	572.75
9/18/2006	20:14:17	25200	68.94	28.973	2.785	157	7.14	4044	46.5359	572.27
9/18/2006	20:19:17	25500	68.96	28.971	2.785	157	7.15	3855	44.3611	571.64
9/18/2006	20:24:17	25800	68.95	28.97	2.785	157	7.15	3691	42.4737	570.95
9/18/2006	20:29:17	26100	68.96	28.97	2.811	156	7.15	3546	40.8121	570.81
9/18/2006	20:34:17	26400	68.96	28.972	2.785	157	7.14	3429	39.4678	570.88
9/18/2006	20:39:17	26700	68.96	28.971	2.785	157	7.15	3325	38.2718	570.54
9/18/2006	20:44:17	27000	68.96	28.972	2.785	157	7.15	3225	37.1166	570.26
9/18/2006	20:49:17	27300	68.96	28.97	2.785	157	7.16	3125	35.9686	570.33
9/18/2006	20:54:17	27600	68.96	28.967	2.785	157	7.16	3041	35.0015	570.19
9/18/2006	20:59:17	27900	68.97	28.967	2.811	158	7.16	2968	34.1673	570.05
9/18/2006	21:04:17	28200	68.97	28.968	2.785	159	7.16	2896	33.335	569.71
9/18/2006	21:09:17	28500	68.97	28.968	2.785	158	7.16	2824	32.5095	569.43
9/18/2006	21:14:17	28800	68.97	28.966	2.811	158	7.16	2744	31.5877	569.37
9/18/2006	21:19:17	29100	68.95	28.97	2.811	160	7.17	2693	30.9966	569.37
9/18/2006	21:24:17	29400	68.94	28.969	2.785	161	7.17	2678	30.8171	568.75
9/18/2006	21:29:17	29700	68.94	28.969	2.785	160	7.16	2718	31.2782	568.47

Date	Time	ET (sec)	Chan[1] Temperature Fahrenheit	Chan[3] Barometric Inches Hg	Chan[5] Battery Volts	Chan[11] ORP millivolts	Chan[12] pH pH	Chan[25] Clark DO microgram	Chan[25] Clark DO Sat %Saturation	Chan[45] Conductivity microSiemens/cm Actual Conductivity
9/18/2006	21:34:17	30000	68.93	28.971	2.785	159	7.13	3473	39.8807	1.43
9/18/2006	21:39:17	30300	68.97	28.972	2.785	274	7.15	7929	91.0961	1.43
9/18/2006	21:44:17	30600	68.99	28.972	2.811	309	7.16	8348	95.932	1.43
9/18/2006	21:49:17	30900	69.06	28.973	2.811	329	7.16	8157	93.7912	1.43
9/18/2006	21:54:17	31200	69.09	28.974	2.811	327	7.16	8152	93.7707	1.43
9/18/2006	21:59:17	31500	69.09	28.973	2.759	337	7.18	7969	91.6704	1.43
9/18/2006	22:04:17	31800	69.08	28.974	2.785	351	7.17	7640	87.8731	1.43
9/18/2006	22:09:17	32100	69.04	28.973	2.785	355	7.17	6739	77.4723	1.43
9/18/2006	22:14:17	32400	69.04	28.972	2.811	358	7.16	5180	59.5589	1.43
9/18/2006	22:19:17	32700	69	28.972	2.811	364	7.17	5718	65.7143	1.43
9/18/2006	22:24:17	33000	69.01	28.971	2.785	367	7.16	5908	67.9104	1.43
9/18/2006	22:29:17	33300	69.01	28.972	2.785	369	7.15	5729	65.843	1.43
9/18/2006	22:34:17	33600	69.03	28.971	2.785	363	7.15	4950	56.9071	1.43
9/18/2006	22:39:17	33900	69.05	28.968	2.785	366	7.14	5390	61.9857	1.43
9/18/2006	22:44:17	34200	69.03	28.966	2.785	366	7.16	5145	59.1589	1.43
9/18/2006	22:49:17	34500	69.03	28.967	2.785	370	7.18	5624	64.6713	1.43
9/18/2006	22:54:17	34800	69.04	28.969	2.785	370	7.18	6522	74.9929	1.43
9/18/2006	22:59:17	35100	69.04	28.969	2.811	372	7.16	6375	73.2984	1.43
9/18/2006	23:04:17	35400	69.06	28.97	2.811	374	7.22	7037	80.9303	1.43
9/18/2006	23:09:17	35700	69.07	28.97	2.785	362	7.22	7147	82.2044	1.43
9/18/2006	23:14:17	36000	69.06	28.971	2.785	362	7.15	7696	88.509	1.43
9/18/2006	23:19:17	36300	69.05	28.971	2.785	378	7.16	7423	85.356	1.43
9/18/2006	23:24:17	36600	69.05	28.971	2.785	368	7.17	7663	88.1158	1.43
9/18/2006	23:29:17	36900	69.05	28.97	2.785	385	7.14	6940	79.8037	1.43
9/18/2006	23:34:17	37200	69.03	28.968	2.811	383	7.15	6247	71.8361	1.43
9/18/2006	23:39:17	37500	69.04	28.967	2.785	388	7.19	6839	78.6397	1.43
9/18/2006	23:44:17	37800	69	28.967	2.811	339	7.16	6554	75.3372	1.43
9/18/2006	23:49:17	38100	69.03	28.964	2.785	380	7.14	6664	76.6353	1.43
9/18/2006	23:54:17	38400	69.04	28.962	2.785	371	7.19	6135	70.5584	1.43
9/18/2006	23:59:17	38700	69.03	28.962	2.811	384	7.2	5925	68.1373	1.43
9/19/2006	0:04:17	39000	68.96	28.963	2.811	250	7.1	7556	86.8217	1.43
9/19/2006	0:09:17	39300	68.97	28.964	2.785	250	7.12	6760	77.6878	1.43
9/19/2006	0:14:17	39600	68.99	28.964	2.785	322	7.11	8493	97.6208	1.43
9/19/2006	0:19:17	39900	69.01	28.965	2.811	341	7.12	8512	97.8543	1.43
9/19/2006	0:24:17	40200	68.95	28.966	2.785	354	7.12	8601	98.8044	2.09
9/19/2006	0:29:17	40500	68.95	28.966	2.785	346	7.09	8624	99.0741	1.43
9/19/2006	0:34:17	40800	68.95	28.966	2.785	259	7.12	8647	99.347	1.43
9/19/2006	0:39:17	41100	68.95	28.963	2.811	192	7.11	8685	99.7811	1.43

Date	Time	ET (sec)	Chan[1] Temperature Fahrenheit	Chan[3] Barometric Inches Hg	Chan[5] Battery Volts	Chan[11] ORP millivolts	Chan[12] pH pH	Chan[25] Clark DO microgram	Chan[25] Clark DO Sat %Saturation	Chan[45] Conductivity microSiemens/cm Actual Conductivity
9/19/2006	0:44:17	41400	68.94	28.959	2.785	168	7.12	8646	99.342	1.43
9/19/2006	0:49:17	41700	68.95	28.956	2.785	162	7.1	7779	89.3989	1.43
9/19/2006	0:54:17	42000	68.95	28.954	2.785	158	7.09	6456	74.2044	1.43
9/19/2006	0:59:17	42300	68.95	28.953	2.785	157	7.12	5754	66.1426	1.43
9/19/2006	1:04:17	42600	68.95	28.951	2.759	156	7.13	5586	64.2149	1.43
9/19/2006	1:09:17	42900	68.95	28.948	2.785	158	7.13	8705	100.066	1.43
9/19/2006	1:14:17	43200	68.94	28.944	2.759	209	7.06	6041	69.4507	1.43
9/19/2006	1:19:17	43500	69	28.941	2.785	267	7.09	5658	65.0979	1.43
9/19/2006	1:24:17	43800	68.99	28.939	2.759	296	7.04	5296	60.9293	1.43
9/19/2006	1:29:17	44100	69.01	28.939	2.785	321	7.11	5240	60.3021	1.43
9/19/2006	1:34:17	44400	69	28.937	2.785	335	7.15	5585	64.2725	1.43
9/19/2006	1:39:17	44700	69.01	28.935	2.785	344	7.14	5920	68.1348	1.43
9/19/2006	1:44:17	45000	69	28.934	2.785	355	7.13	5425	62.4378	1.43
9/19/2006	1:49:17	45300	69	28.935	2.759	358	7.15	7434	85.5466	1.43
9/19/2006	1:54:17	45600	69.02	28.936	2.759	361	7.17	6754	77.74	1.43
9/19/2006	1:59:17	45900	69.01	28.933	2.811	369	7.1	5985	68.8814	1.43
9/19/2006	2:04:17	46200	68.98	28.932	2.785	371	7.14	5605	64.4943	1.43
9/19/2006	2:09:17	46500	68.94	28.933	2.759	372	7.15	5621	64.6442	1.43
9/19/2006	2:14:17	46800	68.94	28.933	2.759	379	7.15	8378	96.3562	1.43
9/19/2006	2:19:17	47100	68.95	28.934	2.811	385	7.16	8767	100.8385	1.43
9/19/2006	2:24:17	47400	68.94	28.935	2.759	385	7.15	8815	101.3685	1.72
9/19/2006	2:29:17	47700	68.96	28.934	2.785	286	7.15	8788	101.0944	1.43
9/19/2006	2:34:17	48000	68.97	28.933	2.811	297	7.13	8759	100.7635	1.43
9/19/2006	2:39:17	48300	68.96	28.932	2.785	261	7.14	5512	63.4124	1.43
9/19/2006	2:44:17	48600	68.94	28.93	2.785	239	7.11	8793	101.1454	1.43
9/19/2006	2:49:17	48900	68.96	28.929	2.811	259	7.11	8784	101.0647	1.43
9/19/2006	2:54:17	49200	68.95	28.928	2.811	226	7.1	8793	101.1515	1.43
9/19/2006	2:59:17	49500	68.95	28.926	2.759	215	7.12	8760	100.7851	1.43
9/19/2006	3:04:17	49800	68.96	28.923	2.785	192	7.11	8777	101.001	1.43
9/19/2006	3:09:17	50100	68.96	28.921	2.785	196	7.12	5425	62.4298	1.43
9/19/2006	3:14:17	50400	68.98	28.92	2.785	283	7.09	8820	101.5241	1.43
9/19/2006	3:19:17	50700	68.99	28.919	2.785	311	7.12	8820	101.5529	1.43
9/19/2006	3:24:17	51000	69	28.916	2.785	329	7.11	8837	101.7685	1.43
9/19/2006	3:29:17	51300	69	28.914	2.785	337	7.11	8871	102.154	1.43
9/19/2006	3:34:17	51600	69	28.913	2.759	346	7.11	8884	102.3035	1.43
9/19/2006	3:39:17	51900	69	28.911	2.785	354	7.13	8868	102.125	1.43
9/19/2006	3:44:17	52200	69	28.91	2.785	360	7.12	8866	102.1197	1.43
9/19/2006	3:49:17	52500	68.99	28.908	2.811	367	7.12	8872	102.1883	1.43

Date	Time	ET (sec)	Chan[1] Temperature Fahrenheit	Chan[3] Barometric Inches Hg	Chan[5] Battery Volts	Chan[11] ORP millivolts	Chan[12] pH pH	Chan[25] Clark DO micrograms	Chan[25] Clark DO Sat %Saturation	Chan[45] Conductivity microSiemens/cm Actual Conductivity
9/19/2006	3:54:17	52800	69	28.907	2.785	367	7.12	8869	102.1721	1.43
9/19/2006	3:59:17	53100	69	28.905	2.785	374	7.12	8885	102.3624	1.43
9/19/2006	4:04:17	53400	68.99	28.904	2.785	372	7.12	8852	101.972	1.43
9/19/2006	4:09:17	53700	68.99	28.904	2.811	373	7.12	8821	101.6121	1.43
9/19/2006	4:14:17	54000	68.99	28.903	2.785	376	7.13	8780	101.1459	1.43
9/19/2006	4:19:17	54300	69	28.901	2.785	378	7.11	8819	101.6028	1.43
9/19/2006	4:24:17	54600	68.99	28.9	2.759	382	7.12	8773	101.0725	1.43
9/19/2006	4:29:17	54900	69	28.899	2.759	381	7.12	8772	101.0653	1.43
9/19/2006	4:34:17	55200	69	28.896	2.785	383	7.13	8692	100.1523	1.43
9/19/2006	4:39:17	55500	68.99	28.895	2.811	383	7.12	8721	100.4894	1.43
9/19/2006	4:44:17	55800	68.98	28.892	2.785	384	7.11	8728	100.5643	1.43
9/19/2006	4:49:17	56100	68.99	28.89	2.785	388	7.14	8809	101.518	1.43
9/19/2006	4:54:17	56400	69	28.886	2.785	383	7.11	8937	103.0294	1.43
9/19/2006	4:59:17	56700	68.99	28.883	2.785	395	7.1	8989	103.625	1.43
9/19/2006	5:04:17	57000	69.01	28.878	2.785	381	7.12	8984	103.6059	1.43
9/19/2006	5:09:17	57300	69	28.876	2.785	384	7.16	9007	103.8605	1.43
9/19/2006	5:14:17	57600	68.99	28.876	2.811	402	7.16	9021	104.0147	1.43
9/19/2006	5:19:17	57900	68.99	28.875	2.785	401	7.17	9029	104.113	1.43
9/19/2006	5:24:17	58200	68.99	28.873	2.811	393	7.19	9053	104.3982	1.43
9/19/2006	5:29:17	58500	68.98	28.873	2.785	399	7.19	9059	104.4557	1.43
9/19/2006	5:34:17	58800	68.99	28.871	2.811	419	7.18	9068	104.5824	1.43
9/19/2006	5:39:17	59100	68.99	28.864	2.785	393	7.12	9069	104.6133	1.43
9/19/2006	5:44:17	59400	68.99	28.861	2.785	386	7.14	9086	104.819	1.43
9/19/2006	5:49:17	59700	68.99	28.858	2.785	399	7.14	9069	104.6384	1.43
9/19/2006	5:54:17	60000	68.99	28.856	2.785	390	7.12	9074	104.6998	1.43
9/19/2006	5:59:17	60300	68.98	28.853	2.759	401	7.13	9085	104.8246	1.43
9/19/2006	6:04:17	60600	68.99	28.849	2.785	402	7.19	9101	105.0394	1.43
9/19/2006	6:09:17	60900	68.97	28.848	2.785	402	7.18	9094	104.9429	1.43
9/19/2006	6:14:17	61200	68.99	28.845	2.785	402	7.18	9086	104.878	1.43
9/19/2006	6:19:17	61500	68.96	28.842	2.785	403	7.19	9092	104.9331	1.43
9/19/2006	6:24:17	61800	68.97	28.84	2.759	407	7.19	9098	105.0172	1.43
9/19/2006	6:29:17	62100	68.96	28.837	2.785	407	7.19	9101	105.0507	1.43
9/19/2006	6:34:17	62400	68.98	28.833	2.785	409	7.18	9093	104.9895	1.43
9/19/2006	6:39:17	62700	68.97	28.832	2.759	413	7.2	9118	105.2763	1.43
9/19/2006	6:44:17	63000	68.99	28.827	2.785	416	7.19	9104	105.1644	1.43
9/19/2006	6:49:17	63300	68.98	28.824	2.785	416	7.19	9112	105.2465	1.43
9/19/2006	6:54:17	63600	68.99	28.82	2.785	418	7.2	9118	105.3376	1.43
9/19/2006	6:59:17	63900	68.94	28.819	2.785	422	7.2	9126	105.3861	1.43

Date	Time	ET (sec)	Chan[1] Temperature Fahrenheit	Chan[3] Barometric Inches Hg	Chan[5] Battery Volts	Chan[11] ORP millivolts	Chan[12] pH pH	Chan[25] Clark DO microgram	Chan[25] Clark DO Sat %Saturation	Chan[45] Conductivity microSiemens/cm Actual Conductivity
9/19/2006	7:04:17	64200	68.93	28.815	2.785	422	7.2	9121	105.3262	1.43
9/19/2006	7:09:17	64500	68.96	28.814	2.785	422	7.21	9091	105.0115	1.43
9/19/2006	7:14:17	64800	68.97	28.813	2.785	423	7.21	9087	104.988	1.43
9/19/2006	7:19:17	65100	68.97	28.81	2.811	420	7.19	9115	105.3261	1.43
9/19/2006	7:24:17	65400	68.97	28.807	2.759	419	7.2	9115	105.336	1.43
9/19/2006	7:29:17	65700	68.97	28.803	2.785	420	7.2	9123	105.4385	1.43
9/19/2006	7:34:17	66000	68.97	28.799	2.785	423	7.19	9126	105.4903	1.43
9/19/2006	7:39:17	66300	68.97	28.795	2.759	427	7.23	9130	105.5569	1.43
9/19/2006	7:44:17	66600	68.99	28.791	2.785	429	7.25	9132	105.6184	1.43
9/19/2006	7:49:17	66900	68.99	28.788	2.785	431	7.25	9128	105.5842	1.43
9/19/2006	7:54:17	67200	69.02	28.786	2.759	433	7.26	9113	105.4498	1.43
9/19/2006	7:59:17	67500	69.03	28.784	2.811	432	7.21	9134	105.7129	1.43
9/19/2006	8:04:17	67800	69.03	28.78	2.759	432	7.2	9103	105.3629	1.43
9/19/2006	8:09:17	68100	69.03	28.778	2.759	441	7.2	9115	105.509	1.43
9/19/2006	8:14:17	68400	69.02	28.774	2.785	432	7.2	9113	105.4886	1.43
9/19/2006	8:19:17	68700	69.03	28.772	2.759	422	7.21	9111	105.4879	1.43
9/19/2006	8:24:17	69000	69.04	28.772	2.759	374	7.19	9140	105.8342	1.43
9/19/2006	8:29:17	69300	69.02	28.773	2.759	435	7.12	9125	105.6345	1.43
9/19/2006	8:34:17	69600	69.03	28.774	2.785	435	7.18	9122	105.6114	1.43
9/19/2006	8:39:17	69900	69.02	28.781	2.759	392	7.18	9126	105.6144	1.43
9/19/2006	8:44:17	70200	69.01	28.786	2.759	429	7.16	9120	105.5148	1.43
9/19/2006	8:49:17	70500	69	28.79	2.785	428	7.17	9143	105.7543	1.43
9/19/2006	8:54:17	70800	69.02	28.794	2.811	424	7.17	9138	105.6999	1.43
9/19/2006	8:59:17	71100	69.03	28.807	2.759	418	7.15	9161	105.9428	1.43
9/19/2006	9:04:17	71400	68.94	28.828	2.785	417	7.18	9160	105.7404	1.43
9/19/2006	9:09:17	71700	68.96	28.829	2.759	415	7.18	9133	105.4492	1.43
9/19/2006	9:14:17	72000	68.98	28.831	2.759	424	7.19	9148	105.6388	1.43
9/19/2006	9:19:17	72300	69	28.838	2.811	414	7.18	9155	105.7131	1.43
9/19/2006	9:24:17	72600	69	28.842	2.811	413	7.18	9103	105.0923	1.43
9/19/2006	9:29:17	72900	69	28.838	2.759	401	7.23	8995	103.8628	1.43
9/19/2006	9:34:17	73200	68.99	28.845	2.785	401	7.2	9112	105.1881	1.43
9/19/2006	9:39:17	73500	69.01	28.844	2.811	403	7.18	9136	105.4841	1.43
9/19/2006	9:44:17	73800	69.01	28.849	2.785	405	7.18	9167	105.8273	1.43
9/19/2006	9:49:17	74100	69.01	28.852	2.759	403	7.19	8936	103.1455	1.43
9/19/2006	9:54:17	74400	69.02	28.848	2.785	406	7.18	8978	103.6507	1.43
9/19/2006	9:59:17	74700	69.01	28.846	2.759	406	7.19	8968	103.536	1.43
9/19/2006	10:04:17	75000	69.02	28.847	2.785	416	7.19	9162	105.7789	1.43
9/19/2006	10:09:17	75300	68.92	28.837	2.785	408	7.17	6898	79.5896	1.43

Date	Time	ET (sec)	Chan[1] Temperature Fahrenheit	Chan[3] Barometric Inches Hg	Chan[5] Battery Volts	Chan[11] ORP millivolts	Chan[12] pH pH	Chan[25] Clark DO micrograms	Chan[25] Clark DO Sat %Saturation	Chan[45] Conductivity microSiemens/cm Actual Conductivity
9/19/2006	10:14:17	75600	68.93	28.833	2.759	406	7.13	8882	102.5004	1.43
9/19/2006	10:19:17	75900	68.94	28.848	2.759	408	7.12	9076	104.6932	1.43
9/19/2006	10:24:17	76200	68.93	28.859	2.759	412	7.15	9081	104.709	1.43
9/19/2006	10:29:17	76500	68.93	28.848	2.759	411	7.1	9155	105.5924	1.43
9/19/2006	10:34:17	76800	68.93	28.871	2.759	397	7.13	9071	104.5384	1.43
9/19/2006	10:39:17	77100	68.94	28.891	2.785	404	7.18	9068	104.4358	1.43
9/19/2006	10:44:17	77400	68.94	28.905	2.785	391	7.18	9091	104.6577	1.43
9/19/2006	10:49:17	77700	68.94	28.926	2.785	407	7.19	9124	104.9553	1.43
9/19/2006	10:54:17	78000	68.94	28.941	2.785	405	7.18	9124	104.9013	1.43
9/19/2006	10:59:17	78300	68.92	28.958	2.759	406	7.15	9151	105.1391	1.43
9/19/2006	11:04:17	78600	68.94	28.95	2.785	400	7.13	9138	105.0395	1.43
9/19/2006	11:09:17	78900	68.93	28.961	2.785	417	7.1	9079	104.2956	1.43
9/19/2006	11:14:17	79200	68.92	28.965	2.785	414	7.12	9024	103.6454	1.43
9/19/2006	11:19:17	79500	68.96	28.961	2.785	421	7.04	8985	103.2571	1.43
9/19/2006	11:24:17	79800	68.97	28.969	2.785	425	7.06	9078	104.3082	1.43
9/19/2006	11:29:17	80100	68.96	28.975	2.759	431	7.06	9033	103.7583	1.43
9/19/2006	11:34:17	80400	68.96	28.983	2.785	433	7.05	8876	101.9285	1.43
9/19/2006	11:39:17	80700	68.97	28.982	2.759	433	7.06	9026	103.6673	1.43
9/19/2006	11:44:17	81000	68.96	28.99	2.759	430	7.04	9026	103.6196	1.43
9/19/2006	11:49:17	81300	68.97	29.001	2.785	441	7.09	8919	102.361	1.43
9/19/2006	11:54:17	81600	68.97	29.002	2.811	432	7.06	9024	103.5569	1.43
9/19/2006	11:59:17	81900	68.96	28.998	2.785	421	7.09	8956	102.793	1.43
9/19/2006	12:04:17	82200	68.97	28.999	2.759	418	7.1	8747	100.3961	1.43
9/19/2006	12:09:17	82500	68.97	29.002	2.759	415	7.12	8702	99.8663	1.43
9/19/2006	12:14:17	82800	68.97	29.001	2.785	423	7.12	9006	103.3665	1.43
9/19/2006	12:19:17	83100	68.97	29.002	2.785	413	7.08	9026	103.5884	1.43
9/19/2006	12:24:17	83400	68.97	29.006	2.785	419	7.1	8968	102.8982	1.43
9/19/2006	12:29:17	83700	68.97	29.005	2.785	418	7.1	8987	103.125	1.43
9/19/2006	12:34:17	84000	68.96	29.011	2.759	419	7.09	9016	103.4355	1.43
9/19/2006	12:39:17	84300	68.96	29.338	2.785	424	7.1	8996	102.029	1.43
9/19/2006	12:44:17	84600	68.9	29.338	2.759	430	4.98	9013	102.1482	1.43
9/19/2006	12:49:17	84900	68.9	29.337	2.811	452	5.15	9037	102.4242	1.43
9/19/2006	12:54:17	85200	68.95	29.335	2.785	413	6.99	9011	102.1956	1.43
9/19/2006	12:59:17	85500	68.93	29.334	2.785	507	6.88	8928	101.2374	1.43
9/19/2006	13:04:17	85800	68.9	29.332	2.811	497	5.81	9013	102.1677	1.43
9/19/2006	13:09:17	86100	68.9	29.329	2.785	510	7.37	8898	100.8721	1.43
9/19/2006	13:14:17	86400	68.91	29.33	2.811	515	7.34	8922	101.1588	1.43
9/19/2006	13:19:17	86700	68.95	29.326	2.811	571	7.19	8964	101.6912	1.43

Date	Time	ET (sec)	Chan[1] Temperature Fahrenheit	Chan[3] Barometric Inches Hg	Chan[5] Battery Volts	Chan[11] ORP millivolts	Chan[12] pH pH	Chan[25] Clark DO microgram	Chan[25] Clark DO Sat %Saturation	Chan[45] Conductivity microSiemens/cm Actual Conductivity
9/19/2006	13:24:17	87000	68.92	29.324	2.785	525	7.41	8920	101.163	1.43
9/19/2006	13:29:17	87300	68.91	29.323	2.785	529	7.14	8935	101.3224	1.43
9/19/2006	13:34:17	87600	68.9	29.321	2.811	533	6.96	8965	101.6678	1.43
9/19/2006	13:39:17	87900	68.91	29.321	2.811	536	6.67	9000	102.0662	1.43
9/19/2006	13:44:17	88200	68.92	29.318	2.785	549	6.97	8944	101.4587	1.43
9/19/2006	13:49:17	88500	68.91	29.32	2.811	541	6.83	8926	101.2432	1.43
9/19/2006	13:54:17	88800	68.92	29.319	2.785	551	6.87	8852	100.4079	1.43
9/19/2006	13:59:17	89100	68.93	29.319	2.811	547	7.04	8866	100.5768	1.43
9/19/2006	14:04:17	89400	68.92	29.318	2.811	529	7.41	8872	100.6387	1.43
9/19/2006	14:09:17	89700	68.91	29.318	2.785	521	7.34	8912	101.0764	1.43

ASSOCIATED BLN COL APPLICATION REVISIONS ATTACHMENTS

BLN COL 2.4-5

TABLE 2.4.12-206 (Sheet 1 of 2)
MONTHLY GROUNDWATER HYDRAULIC GRADIENT AND FLOW VELOCITY

Groundwater Velocity and Travel Time from BLN Unit 3 to Town Creek Embayment

Date	07/11/06	08/31/06	09/21/06	10/26/06	11/13/06	12/11/06	01/04/07	02/01/07	03/05/07	04/17/07	05/08/07
Elevation High (E_H) (ft)	598.08	600.07	599.97	601.38	601.69	599.23	602.31	602.14	602.09	601.94	600.84
Elevation Low (E_L) (ft)	595.18	594.65	593.94	594.51	594.68	593.98	594.94	594.11	594.06	594.57	594.81
Hydraulic Gradient (E_H-E_L)/L	$1.81x10^{-3}$	$3.39x10^{-3}$	$3.77x10^{-3}$	$4.29x10^{-3}$	$4.38x10^{-3}$	$3.28x10^{-3}$	$4.61x10^{-3}$	$5.02x10^{-3}$	$5.02x10^{-3}$	$4.61x10^{-3}$	$3.77x10^{-3}$
Velocity (V) (ft/day)	1.20	2.24	2.49	2.84	2.90	2.17	3.05	3.32	3.32	3.05	2.49
Travel Time (T) (years)	3.65	1.96	1.76	1.54	1.51	2.02	1.44	1.32	1.32	1.44	1.76

Assumptions:
Hydraulic gradient is between MW-1217b (E_H) and SW-4 Town Creek embayment surface (E_L).
Pathway distance (L) = 1600 ft.
Hydraulic conductivity (K_h) = $4.2x10^{-3}$ cm/s
porosity (η) = 0.018
Equation for velocity: $V = (K_h \times [E_H - E_L]/L)/\eta$ (Darcy equation for average linear velocity).
Equations for travel time: T = L/V.
Conversions: 1 day = 86,400 sec.; 1 ft. = 30.48 cm; 1 year = 365.25 days

TABLE 2.4.12-206 (Sheet 2 of 2)
MONTHLY GROUNDWATER HYDRAULIC GRADIENT AND FLOW VELOCITY

BLN COL 2.4-5

Groundwater Velocity and Travel Time from BLN Unit 4 to the Intake Structure Channel

Date	07/11/06	08/31/06	09/21/06	10/26/06	11/13/06	12/11/06	01/04/07	02/01/07	03/05/07	04/17/07	05/08/07
Elevation High (E_H) (ft)	608.10	608.57	608.05	610.58	610.48	607.99	612.15	609.99	610.25	610.40	608.28
Elevation Low (E_L) (ft)	595.07	593.69	593.97	594.37	594.58	594.17	594.70	594.09	593.95	594.55	594.66
Hydraulic Gradient (E_H-E_L)/L	$5.01x10^{-3}$	$5.72x10^{-3}$	$5.42x10^{-3}$	$6.23x10^{-3}$	$6.12x10^{-3}$	$5.32x10^{-3}$	$6.71x10^{-3}$	$6.12x10^{-3}$	$6.27x10^{-3}$	$6.10x10^{-3}$	$5.24x10^{-3}$
Velocity (V) (ft/day)	3.31	3.79	3.58	4.12	4.04	3.52	4.44	4.04	4.15	4.03	3.46
Travel Time (T) (years)	2.15	1.88	1.99	1.73	1.76	2.02	1.60	1.76	1.72	1.77	2.05

Assumptions:
Hydraulic gradient is between MW-1204c (E_H) and SW-2 Intake Structure surface (E_L).
Pathway distance (L) = 2600 ft.
Hydraulic conductivity (K_h) = $4.2x10^{-3}$ cm/s
porosity (η) = 0.018
Equation for velocity: $V = (K_h \times [E_H - E_L]/L)/\eta$ (Darcy equation for average linear velocity).
Equations for travel time: T = L/V.
Conversions: 1 day = 86,400 sec.; 1 ft. = 30.48 cm; 1 year = 365.25 days